3GPP TSG CN Plenary Meeting #16   **NP-020242**
5th - 7th June 2002. Marco Island, USA.

Source: **TSG CN WG 1**

Title: **CRs to Rel-5 on Work Item TEI5 towards 24.008**

Agenda item: **8.8**

Document for: **APPROVAL**

<u>**Introduction:**</u>

This document contains **8** CRs on **Rel-5** Work Item **"TEI5"**, that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #16 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Version Current	Version-New	Meeting-2nd-Level	Doc-2nd-Level
24.008	554	2	Rel-5	Restriction of the 0kbits maximum bitrate	F	5.3.0	5.4.0	N1-23	N1-020894
24.008	607	1	Rel-5	Handling of SM STATUS(#81, #97) and invalid TI of Secondary PDP context	F	5.3.0	5.4.0	N1-23	N1-020914
24.008	615		Rel-5	Deletion of ePLMN list when the fifth RAU attempt is reached	F	5.3.0	5.4.0	N1-24	N1-021127
24.008	618	1	Rel-5	Conditions when to update the "RPLMN Last used Access Technology" information	F	5.3.0	5.4.0	N1-24	N1-021407
24.008	619	1	Rel-5	SIM removal and change of RA during detach procedure	F	5.3.0	5.4.0	N1-24	N1-021409
24.008	626		Rel-5	Correction of definition of SSD in QoS IE	F	5.3.0	5.4.0	N1-24	N1-021279
24.008	631		Rel-5	Addition of missing references to TS 25.304	F	5.3.0	5.4.0	N1-24	N1-021308
24.008	632	1	Rel-5	DRX parameter update with RAU procedure	C	5.3.0	5.4.0	N1-24	N1-021431

CR-Form-v5

CHANGE REQUEST

| ⌘ | **24.008** | CR | **554** | ⌘**rev** | **2** | ⌘ | Current version: | **5.3.0** | ⌘ |

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

Proposed change affects: ⌘   (U)SIM ☐   ME/UE **X**   Radio Access Network ☐   Core Network **X**

Title:	⌘	Restriction of the 0kbits maximum bitrate
Source:	⌘	Ericsson
Work item code: ⌘	TEI-5	***Date:*** ⌘ 2002-04-08

Category:	⌘	**F**	***Release:*** ⌘ REL-5

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

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

Reason for change:	⌘	In current version of 24.008, it is allowed the mobile to request a maximum bandwidth of 0 kbps in the Session Management messages. However the reason to specify in 24.008 is that the GTP requires this codepoint for the GTP signalling, and the GTP specification (29.060) refers to 24.008 for the coding of the QoS information element. Thus it was not the intention that the mobile is able to request 0 kbps maximum bandwidth for both uplink and downlink directions at the same time.
Summary of change: ⌘		The restriction of the 0kbps value for max bitrate (when it is encoded for both directions) has been added.
Consequences if not approved:	⌘	A transaction of 0 kbps for both Uplink and Downlink is still allowed. Besides being incorrect, such transaction will not be of any use and takes up processing resources in the network.

Clauses affected:	⌘	10.5.6.5
Other specs affected:	⌘ ☐	Other core specifications ⌘
	☐	Test specifications
	☐	O&M Specifications
Other comments:	⌘	The LS from S2 (S2-013079 in N1-011983), to prevent the mobile to send a maximum bandwidth of 0kbps code point over the air interface is related.

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

10.5.6.5   Quality of service

The purpose of the *quality of service* information element is to specify the QoS parameters for a PDP context.

The QoS IE is defined to allow backward compatibility to earlier version of Session Management Protocol.

The *quality of service* is a type 4 information element with a length of 13octets.

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

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

Traffic class, octet 6 (see 3GPP TS 23.107) Bits 8 7 6 In MS to network direction: 0 0 0   Subscribed traffic class In network to MS direction: 0 0 0   Reserved In MS to network direction and in network to MS direction : 0 0 1   Conversational class 0 1 0   Streaming class 0 1 1   Interactive class 1 0 0   Background class 1 1 1   Reserved The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of this protocol.   The MS shall consider all other values as reserved. Maximum SDU size, octet 7 (see 3GPP TS 23.107) In MS to network direction: 0 0 0 0 0 0 0 0   Subscribed maximum SDU size 1 1 1 1 1 1 1 1   Reserved In network to MS direction: 0 0 0 0 0 0 0 0   Reserved 1 1 1 1 1 1 1 1   Reserved In MS to network direction and in network to MS direction : For values in the range 00000001 to 10010110 the Maximum SDU size value is binary coded in 8 bits, using a granularity of 10 octets, giving a range of values from 10 octets to 1500 octets. Values above 10010110 are as below: 1 0 0 1 0 1 1 1   1502 octets 1 0 0 1 1 0 0 0   1510 octets 1 0 0 1 1 0 0 1   1520 octets   The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of this protocol. The MS shall consider all other values as reserved.   Maximum bit rate for uplink, octet 8 Bits 8 7 6 5 4 3 2 1 In MS to network direction: 0 0 0 0 0 0 0 0   Subscribed maximum bit rate for uplink In network to MS direction:

```
0 0 0 0 0 0 0 0    Reserved
In MS to network direction and in network to MS direction :
0 0 0 0 0 0 0 1    The maximum bit rate is binary coded in 8 bits, using a granularity of 1 kbps
0 0 1 1 1 1 1 1    giving a range of values from 1 kbps to 63 kbps in 1 kbps increments.

0 1 0 0 0 0 0 0    The maximum bit rate is 64 kbps +  ((the binary coded value in 8 bits –01000000) * 8 kbps)
0 1 1 1 1 1 1 1    giving a range of values from 64 kbps to 568 kbps in 8 kbps increments.

1 0 0 0 0 0 0 0    The maximum bit rate is 576 kbps + ((the binary coded value in 8 bits –10000000) * 64 kbps)
1 1 1 1 1 1 1 0    giving a range of values from 576 kbps to 8640 kbps in 64 kbps increments.

1 1 1 1 1 1 1 1    0kbps
```

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

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

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

CR-Form-v5

CHANGE REQUEST

| ⌘ | **24.008** | CR | **607** | ⌘**rev** | **1** | ⌘ | Current version: | **5.3.0** | ⌘ |

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

Proposed change affects: ⌘   (U)SIM ☐   ME/UE **X**   Radio Access Network ☐   Core Network **X**

Title:	⌘	Handling of SM STATUS(#81, #97) and invalid TI of Secondary PDP context
Source:	⌘	Siemens AG
Work item code: ⌘	TEI-5	*Date:* ⌘ 10.04.2002
Category:	⌘ **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 <u>TR 21.900</u>.

Use <u>one</u> of the following releases:
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R96   (Release 1996)
R97   (Release 1997)
R98   (Release 1998)
R99   (Release 1999)
REL-4   (Release 4)
REL-5   (Release 5)

Reason for change: ⌘	1.)	An SM STATUS message with cause value #81 is the reaction on a MODIFY PDP CONTEXT REQUEST or DEACTIVATE PDP CONTEXT REQUEST message when these are identified by a transaction identifier that is currently not related to an active PDP context or a PDP context that is in process of activation or deactivation (section 8.3.2.)
According to TS 24.008, section 6.1.3.6, the reaction on the SM STATUS is implementation dependent. This may lead to the case that an SM instance ignores the SM STATUS and continues the handling specified for PDP context modification or deactivation. This leads to the repetition of the request messages (and SM STATUS) and in case of PDP context modification to the case that the PDP context is not released, as it should be done since the peer entity does not hold the corresponding instance.
------------------ |
| | 2.) | The related ongoing SM procedure shall be aborted when an SM STATUS with (#97 Message type non-existent or not implement) is received.
------------------ |
| | 3.) | The error handling for a (primary) PDP context that is related to a wrong TI (section 8.3.2) needs also to be applied to a secondary PDP context.
------------------ |
| | 4.) | Bullet c and d in 8.3.2 apply only to one direction of transmission. The opposite direction is covered by 8.4, "Unknown or unforeseen message type".
------------------ |
| | 5.) | Incorrect reference in Annex I.2 |
| Summary of change:⌘[H | | Deactivation of the PDP context in case of SM STATUS (#81) message as response to:
- MODIFY PDP CONTEXT REQUEST
- DEACTIVATE PDP CONTEXT REQUEST

Abort of the related ongoing SM procedure in general as response to an SM |

		STATUS (#97) message ------------ Local deactivation of a secondary PDP context and proceeding with the new request when the PDP context related to the given TI is already in use.
Consequences if not approved:	⌘	Different behaviour of by MS/CN as reaction on SM STATUS (#81) for a transaction identifier not related to a PDP context but used in: - MODIFY PDP CONTEXT REQUEST - DEACTIVATE PDP CONTEXT REQUEST Air resources may be wasted when the request is repeated (and the SM STATUS as response to that). The PDP context may be kept (in case of modification) for that peer entity that is not related to the corresponding instance. ----------------- Inconsistent behaviour in case of ACTIVATE SECONDARY PDP CONTEXT REQUEST with a TI that is already in use

Clauses affected:	⌘	6.1.3.6, 8.3.2., Annex I.2

Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	

Other comments:	⌘	

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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.

6.1.3.6   Receiving a SM STATUS message by a SM entity

If the SM entity of the MS receives an SM STATUS message the MS shall take different actions depending on the received SM cause value:

> #81   Invalid transaction identifier value
>
> The MS shall abort any ongoing SM procedure related to the received transaction identifier value, stop any related timer, and deactivate the corresponding PDP context locally (without peer to peer signalling between the MS and the network).
>
> #97   Message type non-existent or not implemented
>
> The MS shall abort any ongoing SM procedure related to the received transaction identifier value and stop any related timer.

If the SM entity of the MS receives a SM STATUS message with any other SM cause value no state transition and no specific action shall be taken as seen from the radio interface, i.e. local actions are possible.

If the SM entity of the network receives an SM STATUS message the network shall take different actions depending on the received SM cause value:

> #81   Invalid transaction identifier value
>
> The network shall abort any ongoing SM procedure related to the received transaction identifier value, stop any related timer, and deactivate the corresponding PDP context locally (without peer to peer signalling between the MS and the network).
>
> #97   Message type non-existent or not implemented
>
> The network shall abort any ongoing SM procedure related to the received transaction identifier value and stop any related timer.

The actions to be taken in the network on receiving a SM STATUS message with any other SM cause value in the network are an implementation dependent option.

####################### Next Modified Section ##########################

8.3.2   Session Management

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

> a) Whenever any session management message except ACTIVATE PDP CONTEXT REQUEST, ACTIVATE SECONDARY PDP CONTEXT REQUEST, or SM-STATUS is received by the network specifying a transaction identifier which is not recognized as relating to an active context or to a context that is in the process of activation or deactivation, the network shall send a SM-STATUS message with cause #81 "invalid transaction identifier value" using the received transaction identifier value including the extension octet and remain in the PDP-INACTIVE state.
>
> b) Whenever any session management message except REQUEST PDP CONTEXT ACTIVATION or SM-STATUS is received by the MS specifying a transaction identifier which is not recognized as relating to an active context or to a context that is in the process of activation or deactivation, the MS shall send a SM-STATUS message with cause #81 "invalid transaction identifier value" using the received transaction identifier value including the extension octet and remain in the PDP-INACTIVE state.
>
> c) When a REQUEST PDP CONTEXT ACTIVATION message is received by the MS with a transaction identifier flag set to "1", this message shall be ignored.

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

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

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

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

###################### Next Modified Section #########################

I.2   Causes related to invalid messages

Cause value = 81 Invalid transaction identifier value.

> See annex H, subclause H.5.1.

Cause value = 95 Semantically incorrect message.

> See annex H, subclause H.5.<u>5</u><s>10</s>.

Cause value = 96 Invalid mandatory information.

> See annex H, subclause H.6.1.

Cause value = 97 Message type non-existent or not implemented.

> See annex H, subclause H.6.2.

Cause value = 98 Message not compatible with protocol state.

> See annex H, subclause H.6.3.

Cause value = 99 Information element non-existent or not implemented.

> See annex H, subclause H.6.4.

Cause value = 100 Conditional IE error.

> See annex H, subclause H.6.5.

Cause value = 101 Message not compatible with protocol state.

> See annex H, subclause H.6.6.

Cause value = 111 Protocol error, unspecified.

> See annex H, subclause H.6.8.

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CHANGE REQUEST

| ⌘ | **24.008** CR **615** | ⌘**rev** | **-** | ⌘ | Current version: | **5.3.0** | ⌘ |

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Proposed change affects: ⌘   (U)SIM ☐   ME/UE **X**   Radio Access Network ☐   Core Network ☐

Title:	⌘	Deletion of ePLMN list when the fifth RAU attempt is reached
Source:	⌘	Siemens AG
Work item code: ⌘	TEI5	***Date:*** ⌘ 07.05.2002

Category: ⌘ **F**   ***Release:*** ⌘ REL-5

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

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

Reason for change: ⌘	Exept for the normal RAU procedure it has been defined for the combined and non combined attach as well as for the normal RAU that the *list of equivalent PLMNs* shall be deleted once the attempt counter is greater than or equal to 5. In order to ensure that the MS behaviour is consistent it is proposed to also delete the the *list of equivalent PLMNs* if the attempt counter reaches its limit during a non-combined RAU procedure.
Summary of change: ⌘	The ePLMN list shall be deleted – analogous to the combined RAU procedure – in the normal RAU procedure when the fifth attempt is reached.
Consequences if not approved: ⌘	Inconsistant MS behaviour depending on the network mode of operation.

Clauses affected:	⌘	4.7.5.1.5

Other specs affected:	⌘ ☐	Other core specifications	⌘
	☐	Test specifications	
	☐	O&M Specifications	

Other comments:	⌘	

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, <u>shall delete the list of equivalent PLMNs,</u> 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 4.2.4.1.2).

──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]).

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CHANGE REQUEST

| ⌘ | **24.008** CR **618** | ⌘ **rev** | **1** | ⌘ | Current version: | **5.3.0** | ⌘ |

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

Proposed change affects: ⌘   (U)SIM☐   ME/UE **X**   Radio Access Network☐   Core Network☐

Title:	⌘	Conditions when to update the "RPLMN Last used Access Technology" information
Source:	⌘	Siemens AG
Work item code: ⌘	GPRS	**Date:** ⌘ 13.05.02
Category:	⌘ **F**	**Release:** ⌘ REL-5

Use one of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
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Use one of the following releases:
2 (GSM Phase 2)
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R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	It is not specified when the MS shall update the EF$_{RPLMNAcT}$ (RPLMN Last used Access Technology) defined in 11.11 and 31.102. As the LAI and thus the RPLMN is stored once the LU is accepted by the network on the SIM/USIM, it is proposed to also store the Access Technology in this point in time.
Summary of change: ⌘		It is proposed to update the EF$_{RPLMNAcT}$ field once the LAI is stored in the EF$_{LOCI}$.
Consequences if not approved:	⌘	Ambiguous specification with the risk of different MS implementations.

Clauses affected:	⌘	4.4.4.6; 4.7.3.2.3.1; 4.7.5.1.3; 4.7.5.2.3.1

Other specs affected:	⌘ ☐	Other core specifications ⌘
	☐	Test specifications
	☐	O&M Specifications

Other comments:	⌘	

4.4.4.6 Location updating accepted by the network

If the location updating is accepted by the network a LOCATION UPDATING ACCEPT message is transferred to the mobile station.

In case the identity confidentiality service is active (see subclauses 4.3.1 and 4.4.4.4), the TMSI reallocation may be part of the location updating procedure. The TMSI allocated is then contained in the LOCATION UPDATING ACCEPT message together with the location area identifier LAI. The network shall in this case start the supervision timer T3250 as described in subclause 4.3.1.

If the network wishes to prolong the RR connection to allow the mobile station to initiate MM connection establishment (for example if the mobile station has indicated in the LOCATION UPDATING REQUEST that it has a follow-on request pending) the network shall send "follow on proceed" in the LOCATION UPDATING ACCEPT and start timer T3255.

The mobile station receiving a LOCATION UPDATING ACCEPT message shall store the received location area identification LAI and, if supported by the SIM, the currently selected access technology, stop timer T3210, reset the attempt counter and set the update status in the SIM to UPDATED. If the message contains an IMSI, the mobile station is not allocated any TMSI, and shall delete any TMSI in the SIM accordingly. If the message contains a TMSI, the mobile station is allocated this TMSI, and shall store this TMSI in the SIM and a TMSI REALLOCATION COMPLETE shall be returned to the network. If neither IMSI nor TMSI is received in the LOCATION UPDATING ACCEPT message, the old TMSI if any available shall be kept.

If the LAI or PLMN identity contained in the LOCATION UPDATING ACCEPT message is a member of any of the "forbidden lists" then any such entries shall be deleted.

The network may also send a list of "equivalent PLMNs" in the LOCATION UPDATING ACCEPT message. Each entry of the list contains a PLMN code (MCC+MNC). The mobile station shall store the list, as provided by the network, except that any PLMN code that is already in the "forbidden PLMN list" shall be removed from the "equivalent PLMNs" list before it is stored by the mobile station. In addition the mobile station shall add to the stored list the PLMN code of the network that sent the list. All PLMNs in the stored list shall be regarded as equivalent to each other for PLMN selection, cell selection/re-selection and handover. The stored list in the mobile station shall be replaced on each occurrence of the LOCATION UPDATING ACCEPT message. If no list is contained in the message, then the stored list in the mobile station shall be deleted. The list shall be stored in the mobile station while switched off so that it can be used for PLMN selection after switch on.

After that, the mobile station shall act according to the presence of the "Follow-on proceed" information element in the LOCATION UPDATING ACCEPT; if this element is present and the mobile station has a CM application request pending, it shall send a CM SERVICE REQUEST to the network and proceed as in subclause 4.5.1.1. Otherwise, it shall start timer T3240 and enter state WAIT FOR NETWORK COMMAND.

Furthermore, the network may grant authorisation for the mobile station to use GSM-Cordless Telephony System (CTS) in the Location Area and its immediate neighbourhood. The mobile should memorise this permission in non-volatile memory. If the "CTS permission" IE is not present in the message, the mobile is not authorised to use GSM-CTS, and shall accordingly delete any memorised permission.

NOTE: the interaction between CTS and GPRS procedures are not yet defined.

- ## 4.7.3.1.3 GPRS attach accepted by the network

If the GPRS attach request is accepted by the network, an ATTACH ACCEPT message is sent to the MS. The P-TMSI reallocation may be part of the GPRS attach procedure. When the ATTACH REQUEST includes the IMSI, the SGSN shall allocate the P-TMSI. The P-TMSI that shall be allocated is then included in the ATTACH ACCEPT message together with the routing area identifier. The network shall, in this case, change to state GMM-COMMON-PROCEDURE-INITIATED and shall start timer T3350 as described in subclause 4.7.6. Furthermore, the network may assign a P-TMSI signature for the GMM context which is then also included in the ATTACH ACCEPT message. If the LAI or PLMN identity that has been transmitted in the ATTACH ACCEPT message is a member of any of the "forbidden" lists, any such entry shall be deleted. Additionally, the network shall include the radio priority level to be used by the MS for mobile originated SMS transfer in the ATTACH ACCEPT message.

In GSM, the Cell Notification information element shall be included in the ATTACH ACCEPT message by the network which indicates that the Cell Notification is supported by the network.

In UMTS, the network should prolong the PS signalling connection if the mobile station has indicated a follow-on request pending in ATTACH REQUEST. The network may also prolong the PS signalling connection without any indication from the mobile terminal.

The MS, receiving an ATTACH ACCEPT message, stores the received routing area identification and, if supported by the SIM, the currently selected access technology, stops timer T3310, reset the GPRS attach attempt counter, reset the routing area updating attempt counter, enters state GMM-REGISTERED and sets the GPRS update status to GU1 UPDATED.

If the message contains a P-TMSI, the MS shall use this P-TMSI as the new temporary identity for GPRS services. In this case, an ATTACH COMPLETE message is returned to the network. The MS shall delete its old P-TMSI and shall store the new one. If no P-TMSI has been included by the network in the ATTACH ACCEPT message, the old P-TMSI, if any available, shall be kept.

If the message contains a P-TMSI signature, the MS shall use this P-TMSI signature as the new temporary signature for the GMM context. The MS shall delete its old P-TMSI signature, if any is available, and shall store the new one. If the message contains no P-TMSI signature, the old P-TMSI signature, if available, shall be deleted.

The network may also send a list of "equivalent PLMNs" in the ATTACH ACCEPT message. Each entry of the list contains a PLMN code (MCC+MNC). The mobile station shall store the list, as provided by the network, except that any PLMN code that is already in the "forbidden PLMN" list shall be removed from the "equivalent PLMNs" list before it is stored by the mobile station. In addition the mobile station shall add to the stored list the PLMN code of the network that sent the list. All PLMNs in the stored list shall be regarded as equivalent to each other for PLMN selection, cell selection/re-selection and handover. The stored list in the mobile station shall be replaced on each occurrence of the ATTACH ACCEPT message. If no list is contained in the message, then the stored list in the mobile station shall be deleted. The list shall be stored in the mobile station while switched off so that it can be used for PLMN selection after switch on.

After that in UMTS, if the mobile station has indicated follow-on request pending and has a CM application request pending, it shall send an appropriate message (for example ACTIVATE PDP CONTEXT REQUEST) to the network.

In GSM, if the ATTACH ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates. The network receiving an ATTACH COMPLETE message stops timer T3350, changes to GMM-REGISTERED state and considers the P-TMSI sent in the ATTACH ACCEPT message as valid.

- ### 4.7.3.2.3 Combined GPRS attach accepted by the network

Depending on the value of the attach result IE received in the ATTACH ACCEPT message, two different cases can be distinguished:

Case 1) The attach result IE value indicates "combined GPRS attach": IMSI attach for GPRS and non-GPRS services have been successful.

Case 2) The attach result IE value indicates "GPRS only": IMSI attach for GPRS services has been successful but IMSI attach for non-GPRS services has not been successful.

4.7.3.2.3.1 Combined attach successful for GPRS and non-GPRS services

The description for IMSI attach for GPRS services as specified in subclause 4.7.3.1.3 shall be followed. In addition, the following description for IMSI attach for non-GPRS services applies.

The TMSI reallocation may be part of the combined GPRS attach procedure. The TMSI allocated is then included in the ATTACH ACCEPT message together with the location area identification (LAI). The network shall, in this case, change to state GMM-COMMON-PROCEDURE-INITIATED and shall start timer T3350 as described in subclause 4.7.6.

The MS, receiving an ATTACH ACCEPT message, stores the received location area identification and, if supported by the SIM, the currently selected access technology, stops timer T3310, reset the location update attempt counter and sets the update status to U1 UPDATED. If the message contains an IMSI, the mobile station is not allocated any TMSI, and shall delete any TMSI accordingly. If the message contains a TMSI, the MS shall use this TMSI as the new temporary identity. The MS shall delete its old TMSI and shall store the new TMSI. In this case, an ATTACH COMPLETE message is returned to the network. If neither a TMSI nor an IMSI has been included by the network in the ATTACH ACCEPT message, the old TMSI, if any available, shall be kept. The new MM state is MM IDLE, the new GMM state is GMM-REGISTERED.

Any timer used for triggering the location update procedure (e.g T3211, T3212) shall be stopped if running.

The network receiving an ATTACH COMPLETE message stops timer T3350, changes to state GMM-REGISTERED and considers the new TMSI as valid.

- ### 4.7.5.1.3 Normal and periodic routing area updating procedure accepted by the network

If the routing area updating request has been accepted by the network, a ROUTING AREA UPDATE ACCEPT message shall be sent to the MS. The network may assign a new P-TMSI and/or a new P-TMSI signature for the MS. If a new P-TMSI and/or P-TMSI signature have been assigned to the MS, it/they shall be included in the ROUTING AREA UPDATE ACCEPT message together with the routing area identification.

In GSM the Cell Notification information element shall be included in the ROUTING AREA UPDATE ACCEPT message in order to indicate the ability of the network to support the Cell Notification.

The network shall change to state GMM-COMMON-PROCEDURE-INITIATED and shall start the supervision timer T3350 as described in subclause 4.7.6.

If the LAI or PLMN identity contained in the ROUTING AREA UPDATE ACCEPT message is a member of any of the "forbidden" lists then any such entry shall be deleted.

In UMTS, the network should prolong the PS signalling connection if the mobile station has indicated a follow-on request pending in ROUTING AREA UPDATE REQUEST. The network may also prolong the PS signalling connection without any indication from the mobile terminal.

If the PDP context status information element is included in ROUTING AREA UPDATE REQUEST message, 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.

Upon receipt of a ROUTING AREA UPDATE ACCEPT message, the MS stores the received routing area identification and, if supported by the SIM, the currently selected access technology, stops timer T3330, shall reset the routing area updating attempt counter and sets the GPRS update status to GU1 UPDATED. If the message contains a P-TMSI, the MS shall use this P-TMSI as new temporary identity for GPRS services and shall store the new P-TMSI. If no P-TMSI was included by the network in the ROUTING AREA UPDATING ACCEPT message, the old P-TMSI shall be kept. Furthermore, the MS shall store the P-TMSI signature if received in the ROUTING AREA UPDATING ACCEPT message. If no P-TMSI signature was included in the message, the old P-TMSI signature, if available, shall be deleted.

If the PDP context status information element is included in ROUTING AREA UPDATE ACCEPT message, then the MS shall deactivate all those PDP contexts locally (without peer to peer signalling between the MS and network), which are not in SM state PDP-INACTIVE in the MS but are indicated by the network as being in state PDP-INACTIVE.

In GSM, if the ROUTING AREA UPDATE ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates.

The network may also send a list of "equivalent PLMNs" in the ROUTING AREA UPDATE ACCEPT message. Each entry of the list contains a PLMN code (MCC+MNC). The mobile station shall store the list, as provided by the network, except that any PLMN code that is already in the "forbidden PLMN" list shall be removed from the "equivalent PLMNs" list before it is stored by the mobile station. In addition the mobile station shall add to the stored list the PLMN code of the network that sent the list. All PLMNs in the stored list shall be regarded as equivalent to each other for PLMN selection, cell selection/re-selection and handover. The stored list in the mobile station shall be replaced on each occurrence of the ROUTING AREA UPDATE ACCEPT message. If no list is contained in the message, then the stored list in the mobile station shall be deleted. The list shall be stored in the mobile station while switched off so that it can be used for PLMN selection after switch on.

A ROUTING AREA UPDATE COMPLETE message shall be returned to the network if the ROUTING AREA UPDATE ACCEPT message contained:

- a P-TMSI; and/or

- Receive N-PDU Numbers (see 3GPP TS 44.065 [78] and 3GPP TS 25.322).

In this case the Receive N-PDU Numbers values valid in the MS, shall be included in the ROUTING AREA UPDATE COMPLETE message.

NOTE: In UMTS, after a routing area updating procedure, the mobile station can initiate Service Request procedure to request the resource reservation for the active PDP contexts if the resources have been released by the network or send upper layer message (e.g. ACTIVATE PDP CONTEXT REQUEST) to the network via the existing PS signaling connection.

After that in UMTS, if the mobile station has indicated follow-on request pending and has a CM application request pending, it shall send an appropriate message (for example ACTIVATE PDP CONTEXT REQUEST) to the network.

- ### 4.7.5.2.3 Combined routing area updating procedure accepted by the network

Depending on the value of the update result IE received in the ROUTING AREA UPDATE ACCEPT message, two different cases can be distinguished:

Case 1)   The update result IE value indicates "combined RA/LA": Routing and location area updating is successful;

Case 2)   The update result IE value indicates "RA only": Routing area updating is successful, but location area updating is not successful.

A ROUTING AREA UPDATE COMPLETE message shall be returned to the network if the ROUTING AREA UPDATE ACCEPT message contains:

-   a P-TMSI and/or a TMSI; and/or

-   Receive N-PDU Numbers (see 3GPP TS 44.065 [78] and 3GPP TS TS 25.322).

In the latter case, the Receive N-PDU Numbers that are valid in the MS shall be included in the ROUTING AREA UPDATE COMPLETE message.

In UMTS, the network should prolong the PS signalling connection if the mobile station has indicated a follow-on request pending in ROUTING AREA UPDATE REQUEST. The network may also prolong the PS signalling connection without any indication from the mobile terminal.

4.7.5.2.3.1 Combined routing area updating successful

The description for normal routing area update as specified in subclause 4.7.5.1.3 shall be followed. In addition, the following description for location area updating applies.

The handling at the receipt of the ROUTING AREA UPDATE ACCEPT depends on the value received in the update result IE as specified below.

The TMSI reallocation may be part of the combined routing area updating procedure. The TMSI allocated is then included in the ROUTING AREA UPDATE ACCEPT message together with the location area identification (LAI). The network shall, in this case, change to state GMM-COMMON-PROCEDURE-INITIATED and shall start the timer T3350 as described in subclause 4.7.6.

The MS, receiving a ROUTING AREA UPDATE ACCEPT message, stores the received location area identification and, if supported by the SIM, the currently selected access technology, stops timer T3330, enters state MM IDLE, reset the location update attempt counter and sets the update status to U1 UPDATED. If the ROUTING AREA UPDATE ACCEPT message contains an IMSI, the mobile station is not allocated any TMSI, and shall delete any TMSI accordingly. If the ROUTING AREA UPDATE ACCEPT message contains a TMSI, the MS shall use this TMSI as new temporary identity. The MS shall delete its old TMSI and shall store the new TMSI. In this case, an ROUTING AREA UPDATE COMPLETE message is returned to the network. If neither a TMSI nor an IMSI has been included by the network in the ROUTING AREA UPDATE ACCEPT message, the old TMSI, if any is available, shall be kept.

Any timer used for triggering the location updating procedure (e.g. T3211, T3212) shall be stopped if running. The network receiving a ROUTING AREA UPDATE COMPLETE message stops timer T3350, changes to GMM-REGISTERED state and considers the new TMSI as valid.

CR-Form-v5

CHANGE REQUEST

⌘   **24.008 CR 619**   ⌘**rev** **1** ⌘   Current version: **5.3.0** ⌘

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

Proposed change affects: ⌘   (U)SIM ☐   ME/UE **X**   Radio Access Network ☐   Core Network ☐

Title:	⌘	SIM removal and change of RA during detach procedure
Source:	⌘	Siemens AG
Work item code: ⌘		~~GPRS~~TEI5 ***Date:*** ⌘ 13.05.2002

Category:	⌘ **F**	***Release:*** ⌘ REL-5

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

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

Reason for change: ⌘		In the current version of 24.008-4.7.4.1.4.f it is stated that a RAU procedure has to be performed when during the MS initiated detach procedure a change of cell into a new routing area happens:

> *f)*   *Change of cell into a new routing area.*
>
> *If a cell change into a new routing area occurs before a DETACH ACCEPT message has been received, the GPRS detach procedure shall be aborted and re-initiated after successfully performing a routing area updating procedure.*

For the case where the detach procedure is performed due to the removal of the SIM card from the MS an exception should be made: a RAU procedure may take a long time, e.g. due to loss of coverage during the RAU procedure. While the RAU procedure is running the user may want to insert a different SIM card and e.g. use the service of different provider. But in case the RAU procedure has not yet been finished this is not possible despite the fact that coverage of the new provider may be given and PS and CS service would be possible.

Furthermore authentification request which will potentialy performed during the RAU procedure could be answered by the MS once the SIM is removed. Here it is open whether the MS shall abort the RAU and thus also the detach procedure immediately or whether it should answere with a "random" authentification result.

Summary of change: ⌘		If during a MS initiated detach procedure, which was triggered by a SIM removal the MS changes into a cell of a new routing area the detach procedure shall be aborted.
Consequences if not approved: ⌘		A user who wants to insert a new SIM card may not be possible to use the PS and CS service for long time.

Clauses affected:	⌘	4.7.4.1.4

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

Other comments:	⌘	

4.7.4   GPRS detach procedure

The GPRS detach procedure is used:

- to detach the IMSI for GPRS services only. Independent of the network operation mode, this procedure is used by all kind of GPRS MSs;

- as a combined GPRS detach procedure used by GPRS MSs operating in MS operation mode A or B to detach the IMSI for GPRS and non-GPRS services or for non-GPRS services only, if the network operates in network operation mode I; or

- in the case of a network failure condition to indicate to the MS that a re-attach with successive activation of previously active PDP contexts shall be performed.

After completion of a GPRS detach procedure or combined GPRS detach procedure for GPRS and non-GPRS services the GMM context is released.

The GPRS detach procedure shall be invoked by the MS if the MS is switched off, the SIM card is removed from the MS or if the GPRS or non-GPRS capability of the MS is disabled. The procedure may be invoked by the network to detach the IMSI for GPRS services. The GPRS detach procedure causes the MS to be marked as inactive in the network for GPRS services, non-GPRS services or both services.

In GSM, if the GPRS detach procedure is performed, the PDP contexts are deactivated locally without peer to peer signalling between the SM and LLC entities in the MS and the network.

In UMTS, if the GPRS detach procedure is performed, the PDP contexts are deactivated locally without peer to peer signalling between the SM entities in the MS and the network.

4.7.4.1   MS initiated GPRS detach procedure

4.7.4.1.1   MS initiated GPRS detach procedure initiation

The GPRS detach procedure is initiated by the MS by sending a DETACH REQUEST message. The detach type information element may indicate "GPRS detach with switching off", "GPRS detach without switching off", "IMSI detach", "GPRS/IMSI detach with switching off" or "GPRS/IMSI detach without switching off".

The MS shall include the P-TMSI in the DETACH REQUEST message. The MS shall also include a valid P-TMSI signature, if available.

If the MS is not switched off and the MS is in the state GMM_REGISTERED, timer T3321 shall be started after the DETACH REQUEST message has been sent. If the detach type information element value indicates "IMSI Detach" the MS shall enter GMM-REGISTERED.IMSI-DETACH_INITIATED, otherwise the MS shall enter the state GMM-DEREGISTERED-INITIATED. If the detach type information element value indicates "IMSI Detach" or "GPRS/IMSI Detach", state MM IMSI DETACH PENDING is entered. If the MS is to be switched off, the MS shall try for a period of 5 seconds to send the DETACH REQUEST message. If the MS is able to send the DETACH REQUEST message during this time the MS may be switched off .

If the detach type information element value indicates "GPRS detach without switching off " and the MS is attached for GPRS and non-GPRS services and the network operates in network operation mode I, then if in the MS the timer T3212 is not already running, the timer T3212 shall be set to its initial value and restarted after the DETACH REQUEST message has been sent.

4.7.4.1.2   MS initiated GPRS detach procedure completion for GPRS services only

When the DETACH REQUEST message is received by the network, the network shall send a DETACH ACCEPT message to the MS, if the detach type IE value indicates that the detach request has not been sent due to switching off. If switching off was indicated, the procedure is completed when the network receives the DETACH REQUEST message. The network and the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any.

The MS is marked as inactive in the network for GPRS services; state GMM-DEREGISTERED is entered in the MS and the network.

In UMTS, if the detach has been sent due to switching off, then the network shall release the resources in the lower layers for this MS (see 3GPP TS 25.331).

NOTE: When the DETACH REQUEST message is received by the network, and if the detach type IE value indicates that the detach is not due to power off, the authentication and ciphering procedure as well as the identification procedure may be performed.

4.7.4.1.3   MS initiated combined GPRS detach procedure completion

When the DETACH REQUEST message is received by the network, a DETACH ACCEPT message shall be sent to the MS, if the detach type IE value indicates that the detach request has not been sent due to switching off. Depending on the value of the detach type IE the following applies:

GPRS/IMSI detach:
The MS is marked as inactive in the network for GPRS and for non-GPRS services. The network and the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any. The States GMM-DEREGISTERED and MM NULL are entered in both the MS and the network.

In UMTS, if the detach has been sent due to switching off, then the network shall release the resources in the lower layers for this MS (see 3GPP TS 25.331).

IMSI detach:
The MS is marked as inactive in the network for non-GPRS services. State MM NULL is entered in the MS and the network.

4.7.4.1.4   Abnormal cases in the MS

The following abnormal cases can be identified:

a) T3321 time-out

   On the first expiry of the timer, the MS shall retransmit the DETACH REQUEST message and shall reset and restart timer T3321. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3321, the GPRS detach procedure shall be aborted, the MS shall change to state:

   -   MM-NULL if "IMSI detach" was requested;

   -   GMM-REGISTERED.NORMAL-SERVICE if "IMSI Detach" was requested

   -   GMM-DEREGISTERED if "GPRS detach" was requested;

   -   GMM-DEREGISTERED and MM-NULL if "GPRS/IMSI" detach was requested.

b) Lower layer failure before reception of DETACH ACCEPT message

   The detach procedure is aborted and the MS shall change to state:

   -   MM-NULL if "IMSI detach" was requested;

   -   GMM-REGISTERED.NORMAL-SERVICE if "IMSI Detach" was requested

   -   GMM-DEREGISTERED if "GPRS detach" was requested;

   -   GMM-DEREGISTERED and MM-NULL if "IMSI/GPRS" detach was requested.

c) Detach procedure collision

   If the MS receives a DETACH REQUEST message before the MS initiated GPRS detach procedure has been completed, a DETACH ACCEPT message shall be sent to the network.

d) Detach and GMM common procedure collision

   GPRS detach containing cause "power off":

   -   If the MS receives a message used in a GMM common procedure before the GPRS detach procedure has been completed, this message shall be ignored and the GPRS detach procedure shall continue.

GPRS detach containing other causes than "power off"

- If the MS receives a P-TMSI REALLOCATION COMMAND, a GMM STATUS, or a GMM INFORMATION message before the GPRS detach procedure has been completed, this message shall be ignored and the GPRS detach procedure shall continue.

- If the MS receives an AUTHENTICATION AND CIPHERING REQUEST or IDENTITY REQUEST message, before the GPRS detach procedure has been completed, the MS shall respond to it as described in clause 4.7.7 and 4.7.8 respectively.

e) Change of cell within the same RA (GSM only)

If a cell change occurs within the same RA before a DETACH ACCEPT message has been received, then the cell update procedure shall be performed before completion of the detach procedure.

f) Change of cell into a new routing area.

If a cell change into a new routing area occurs before a DETACH ACCEPT message has been received, the GPRS detach procedure shall be aborted and re-initiated after successfully performing a routing area updating procedure. If the detach procedure is performed due to the removal of the SIM the MS shall abort the detach procedure and enter the state GMM-DEREGISTERED.
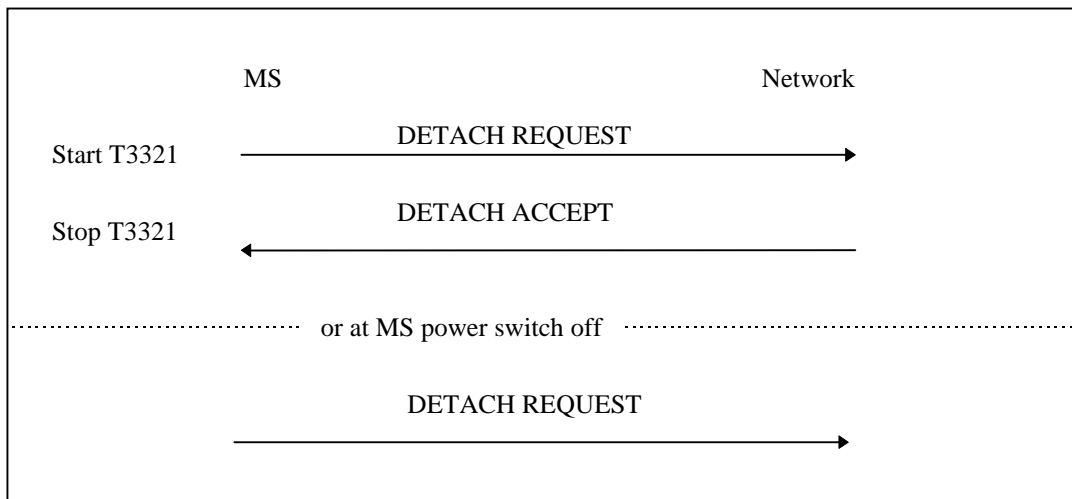
```
                    MS                              Network


                             DETACH REQUEST
Start T3321   ─────────────────────────────────────────►


                             DETACH ACCEPT
Stop T3321    ◄─────────────────────────────────────────


··················· or at MS power switch off ··················


                             DETACH REQUEST
              ─────────────────────────────────────────►
```

Figure 4.7.4/1 3GPP TS 24.008: MS initiated GPRS detach procedure

CR-Form-v5

CHANGE REQUEST

| ⌘ | **24.008** CR **626** | ⌘**rev** | **-** | ⌘ | Current version: | **5.3.0** | ⌘ |

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Correction of definition of SSD in QoS IE

Source:	⌘	Siemens AG

Work item code:	⌘	TEI5	***Date:*** ⌘	06.05.2002

Category:	⌘	**F**

Release:	⌘	REL-5

Use one of the following categories:	Use one 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	*REL-4 (Release 4)*
be found in 3GPP TR 21.900.	*REL-5 (Release 5)*

Reason for change: ⌘	1)	When octet 14 was added to the QoS IE, the length of the information element was increased by 1 in all messages containing the IE (both uplink and **downlink**), but it was not specified how to encode octet 14 in the downlink direction.
	2)	For the uplink direction it was specified that "The MS shall consider all other values as unknown." This needs to be changed to "The network shall …"

Summary of change: ⌘	Octet 14 is spare when sent in downlink direction.	

Consequences if not approved: ⌘	It is unclear how to encode and decode octet 14 of the QoS IE when sent in downlink direction.	

Clauses affected:	⌘	10.5.6.5

Other specs affected:	⌘	☐ Other core specifications	⌘	
		☐ 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/3G_Specs/CRs.htm. Below is a brief summary:

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

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

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

10.5.6.5 Quality of service

The purpose of the *quality of service* information element is to specify the QoS parameters for a PDP context.

The QoS IE is defined to allow backward compatibility to earlier version of Session Management Protocol.

The *quality of service* is a type 4 information element with a length of 14octets. The QoS requested by the MS shall be encoded both in the QoS attributes specified in octets 3-5 and in the QoS attributes specified in octets 6-13.

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

8	7	6	5	4	3	2	1	
\multicolumn{8}{c}{Quality of service IEI}	octet 1
Quality of service IEI								octet 1
Length of quality of service IE								Octet 2
0 0 spare		Delay class			Reliability class			octet 3
Peak throughput				0 spare	Precedence class			octet 4
0 0 0 spare			Mean throughput					octet 5
Traffic Class			Delivery order		Delivery of erroneous SDU			Octet 6
Maximum SDU size								Octet 7
Maximum bit rate for uplink								Octet 8
Maximum bit rate for downlink								Octet 9
Residual BER				SDU error ratio				Octet 10
Transfer delay						Traffic Handling priority		Octet 11
Guaranteed bit rate for uplink								Octet 12
Guaranteed bit rate for downlink								Octet 13
0 0 0 0 Spare				Source Statistics Descriptor				Octet 14

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

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

Reliability class, octet 3 (see 3GPP TS 23.107)
Bits
3 2 1
In MS to network direction:
0 0 0 Subscribed reliability class
In network to MS direction:
0 0 0 Reserved
In MS to network direction and in network to MS direction:
0 0 1 Acknowledged GTP, LLC, and RLC; Protected data
0 1 0 Unacknowledged GTP; Acknowledged LLC and RLC, Protected data
0 1 1 Unacknowledged GTP and LLC; Acknowledged RLC, Protected data
1 0 0 Unacknowledged GTP, LLC, and RLC, Protected data
1 0 1 Unacknowledged GTP, LLC, and RLC, Unprotected data
1 1 1 Reserved

All other values are interpreted as *Unacknowledged GTP and LLC; Acknowledged RLC, Protected data* in this version of the protocol.

Delay class, octet 3 (see 3GPP TS 22.060 and 3GPP TS 23.107)
Bits
6 5 4
In MS to network direction:
0 0 0 Subscribed delay class
In network to MS direction:
0 0 0 Reserved
In MS to network direction and in network to MS direction:
0 0 1 Delay class 1
0 1 0 Delay class 2
0 1 1 Delay class 3
1 0 0 Delay class 4 (best effort)
1 1 1 Reserved

All other values are interpreted as *Delay class 4 (best effort)* in this version
of the protocol.
Bit 7 and 8 of octet 3 are spare and shall be coded all 0.
Precedence class, octet 4 (see 3GPP TS 23.107)
Bits
3 2 1
In MS to network direction:
0 0 0   Subscribed precedence
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   High priority
0 1 0   Normal priority
0 1 1   Low priority
1 1 1   Reserved

All other values are interpreted as *Normal priority* in this version of the protocol.

Bit 4 of octet 4 is spare and shall be coded as 0.

Peak throughput, octet 4 (see 3GPP TS 23.107)
Bits
8 7 6 5
In MS to network direction:
0 0 0 0   Subscribed peak throughput
In network to MS direction:
0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 0 1   Up to 1 000 octet/s
0 0 1 0   Up to 2 000 octet/s
0 0 1 1   Up to 4 000 octet/s
0 1 0 0   Up to 8 000 octet/s
0 1 0 1   Up to 16 000 octet/s
0 1 1 0   Up to 32 000 octet/s
0 1 1 1   Up to 64 000 octet/s
1 0 0 0   Up to 128 000 octet/s
1 0 0 1   Up to 256 000 octet/s
1 1 1 1   Reserved

All other values are interpreted as *Up to 1 000 octet/s* in this
version of the protocol.
Mean throughput, octet 5 (see 3GPP TS 23.107)
Bits
5 4 3 2 1

In MS to network direction:
0 0 0 0 0   Subscribed mean throughput
In network to MS direction:
0 0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 0 0 1   100 octet/h
0 0 0 1 0   200 octet/h
0 0 0 1 1   500 octet/h
0 0 1 0 0   1 000 octet/h
0 0 1 0 1   2 000 octet/h
0 0 1 1 0   5 000 octet/h
0 0 1 1 1   10 000 octet/h
0 1 0 0 0   20 000 octet/h
0 1 0 0 1   50 000 octet/h
0 1 0 1 0   100 000 octet/h
0 1 0 1 1   200 000 octet/h
0 1 1 0 0   500 000 octet/h
0 1 1 0 1   1 000 000 octet/h
0 1 1 1 0   2 000 000 octet/h
0 1 1 1 1   5 000 000 octet/h
1 0 0 0 0   10 000 000 octet/h
1 0 0 0 1   20 000 000 octet/h
1 0 0 1 0   50 000 000 octet/h
1 1 1 1 0   Reserved
1 1 1 1 1   Best effort

The value Best effort indicates that throughput shall be made available to the MS on a per need and availability basis.
All other values are interpreted as *Best effort* in this
version of the protocol.

Bits 8 to 6 of octet 5 are spare and shall be coded all 0.

Delivery of erroneous SDUs, octet 6 (see 3GPP TS 23.107)
Bits
3 2 1
In MS to network direction:
0 0 0   Subscribed delivery of erroneous SDUs
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   No detect ('-')
0 1 0   Erroneous SDUs are delivered ('yes')
0 1 1   Erroneous SDUs are not delivered ('no')
1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Delivery order, octet 6 (see 3GPP TS 23.107)
Bits
5 4 3
In MS to network direction:
0 0   Subscribed delivery order
In network to MS direction:
0 0   Reserved
In MS to network direction and in network to MS direction:
0 1   With delivery order ('yes')
1 0   Without delivery order ('no')
1 1   Reserved

Traffic class, octet 6 (see 3GPP TS 23.107)
Bits
8 7 6
In MS to network direction:
0 0 0   Subscribed traffic class
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   Conversational class
0 1 0   Streaming class
0 1 1   Interactive class
1 0 0   Background class
1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Maximum SDU size, octet 7 (see 3GPP TS 23.107)
In MS to network direction:
0 0 0 0 0 0 0 0   Subscribed maximum SDU size
1 1 1 1 1 1 1 1   Reserved
In network to MS direction:
0 0 0 0 0 0 0 0   Reserved
1 1 1 1 1 1 1 1   Reserved
In MS to network direction and in network to MS direction:

For values in the range 00000001 to 10010110 the Maximum SDU size value is binary coded in 8 bits, using a granularity of 10 octets, giving a range of values from 10 octets to 1500 octets.
Values above 10010110 are as below:
1 0 0 1 0 1 1 1   1502 octets
1 0 0 1 1 0 0 0   1510 octets
1 0 0 1 1 0 0 1   1520 octets

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Maximum bit rate for uplink, octet 8
Bits
8 7 6 5 4 3 2 1
In MS to network direction:
0 0 0 0 0 0 0 0   Subscribed maximum bit rate for uplink
In network to MS direction:
0 0 0 0 0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 0 0 0 0 0 1   The maximum bit rate is binary coded in 8 bits, using a granularity of 1 kbps
0 0 1 1 1 1 1 1   giving a range of values from 1 kbps to 63 kbps in 1 kbps increments.

0 1 0 0 0 0 0 0   The maximum bit rate is 64 kbps + ((the binary coded value in 8 bits –01000000) * 8 kbps)
0 1 1 1 1 1 1 1   giving a range of values from 64 kbps to 568 kbps in 8 kbps increments.

1 0 0 0 0 0 0 0   The maximum bit rate is 576 kbps + ((the binary coded value in 8 bits –10000000) * 64 kbps)
1 1 1 1 1 1 1 0   giving a range of values from 576 kbps to 8640 kbps in 64 kbps increments.

1 1 1 1 1 1 1 1   0kbps

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

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

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

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of the protocol.

The MS shall consider all other values as reserved.

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

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of the protocol.

The MS shall consider all other values as reserved.

Traffic handling priority, octet 11 (see 3GPP TS 23.107)
Bits
2 1
In MS to network direction:
0 0   Subscribed traffic handling priority
In network to MS direction:
0 0   Reserved
In MS to network direction and in network to MS direction:
0 1   Priority level 1
1 0   Priority level 2
1 1   Priority level 3

The Traffic handling priority value is ignored if the Traffic Class is Conversation class, Streaming class or Background class.

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

In MS to network direction:

0 0 0 0 0 0   Subscribed transfer delay

In network to MS direction:

0 0 0 0 0 0   Reserved

In MS to network direction and in network to MS direction:

0 0 0 0 0 1   The Transfer delay is binary coded in 6 bits, using a granularity of 10 ms

0 0 1 1 1 1   giving a range of values from 10 ms to 150 ms in 10 ms increments

0 1 0 0 0 0   The transfer delay is 200 ms + ((the binary coded value in 6 bits – 010000) * 50 ms)

0 1 1 1 1 1   giving a range of values from 200 ms to 950 ms in 50ms increments

1 0 0 0 0 0   The transfer delay is 1000 ms + ((the binary coded value in 6 bits – 100000) * 100 ms)

1 1 1 1 1 0   giving a range of values from 1000 ms to 4000 ms in 100ms increments

1 1 1 1 1 1   Reserved

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

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

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

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

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

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

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

Source Statistics Descriptor, octet 14 (see 3GPP TS 23.107)

Bits

4 3 2 1

In MS to network direction

0 0 0 0   unknown

0 0 0 1   speech

The network~~MS~~ shall consider all other values as unknown.

In network to MS direction

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

Bits 8 to 5 of octet 14 are spare and shall be coded all 0.

CR-Form-v5

CHANGE REQUEST

| ⌘ | **24.008** CR **631** | ⌘**rev** | **-** | ⌘ | Current version: | **5.3.0** | ⌘ |

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title: ⌘	Addition of missing references to TS 25.304	
Source: ⌘	Siemens AG	
Work item code: ⌘	TEI5	***Date:*** ⌘ 06.05.02
Category: ⌘ **F**	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 <u>TR 21.900</u>.	***Release:*** ⌘ REL-5 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)*

Reason for change: ⌘	Subclause 4.2 contains only references to GERAN specific standards for cell (re-)selection. References to the UTRAN specific standard for cell (re-)selection, TS 25.304, are missing.
Summary of change: ⌘	Missing references to TS 25.304 and TS 23.122 are added in subclause 4.2.
Consequences if ⌘ ***not approved:***	Incomplete specification.

Clauses affected: ⌘	2, 4.2, 4.2.1.1, 4.2.3, 4.2.4, 4.2.4.2.5, 4.2.4.3, 4.2.5, 4.2.5.1.1, 4.2.5.1.3, 4.2.5.1.5, 4.2.5.1.6, 4.2.5.1.7
Other specs ⌘ ☐ ***affected:*** ☐ ☐	Other core specifications ⌘ 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/3G_Specs/CRs.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.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   Void.

[2]   Void.

[2a]   3GPP TR 21.905 "Vocabulary for 3GPP Specifications"

[3]   3GPP TS 22.002: "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".

[4]   3GPP TS 22.003: "Teleservices supported by a Public Land Mobile Network (PLMN)".

[5]   3GPP TS 42.009: " Digital cellular telecommunications system (Phase 2+); Security aspects".

[6]   3GPP TS 22.011: " Digital cellular telecommunications system (Phase 2+); Service accessibility".

[7]   3GPP TS 42.017: " Digital cellular telecommunications system (Phase 2+); Subscriber Identity Modules (SIM); Functional characteristics".

[8]   3GPP TS 02.40: "Digital cellular telecommunications system (Phase 2+); Procedures for call progress indications".

[9]   3GPP TS 03.01: "Digital cellular telecommunications system (Phase 2+); Network functions".

[10]   3GPP TS 23.003: "Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification".

[11]   3GPP TS 43.013: "Digital cellular telecommunications system (Phase 2+); Discontinuous Reception (DRX) in the GSM system".

[12]   3GPP TS 23.014: "Digital cellular telecommunications system (Phase 2+); Support of Dual Tone Multi-Frequency (DTMF) signalling".

[12a]   Void.

[13]   3GPP TS 43.020: "Digital cellular telecommunications system (Phase 2+); Security-related network functions".

[14]   3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".

[15]   3GPP TS 24.002: "GSM-UMTS Public Land Mobile Network (PLMN) access reference configuration".

[16]   3GPP TS 44.003: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface; Channel structures and access capabilities".

[17]   3GPP TS 44.004: "Digital cellular telecommunications system (Phase 2+); Layer 1; General requirements".

[18]   3GPP TS 44.005: "Digital cellular telecommunications system (Phase 2+); Data Link (DL) layer; General aspects".

[19]   3GPP TS 44.006: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".

[20]   3GPP TS 24.007: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3; General aspects".

[21]   3GPP TS 24.010: "Digital cellular telecommunications system ; Mobile radio interface layer 3; Supplementary services specification; General aspects".

[22]   3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[23]   3GPP TS 24.012: "Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".

[23a]   3GPP TS 24.071: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 location services specification."

[23b]   3GPP TS 44.031 "Digital cellular telecommunication system (Phase 2+); Location Services LCS); Mobile Station (MS) - Serving Mobile Location Centre (SMLC); Radio Resource LCS Protocol (RRLP)".

[23c]   3GPP TS 25.331: "3rd Generation Partnership Project;Technical Specification Group Radio Access Network; Radio Resource Control (RRC) protocol specification"

[24]   3GPP TS 24.080: "Digital cellular telecommunications system (Phase 2+); Mobile radio Layer 3 supplementary service specification; Formats and coding".

[25]   3GPP TS 24.081: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services; Stage 3".

[26]   3GPP TS 24.082: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services; Stage 3".

[27]   3GPP TS 24.083: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".

[28]   3GPP TS 24.084: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services; Stage 3".

[29]   3GPP TS 24.085: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services; Stage 3".

[30]   3GPP TS 24.086: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) supplementary services; Stage 3".

[31]   3GPP TS 24.088: "Call Barring (CB) supplementary services; Stage 3".

[32]   3GPP TS 45.002: "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path".

[33]   3GPP TS 45.005: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".

[34]   3GPP TS 45.008: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".

[35]   3GPP TS 45.010: "Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronization".

[36]   3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[37]   3GPP TS 29.002: "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification".

[38]   3GPP TS 29.007: "Digital cellular telecommunications system (Phase 2+); General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[39]   3GPP TS 51.010: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification".

[40]   3GPP TS 51.021: "Digital cellular telecommunications system (Phase 2); GSM radio aspects base station system equipment specification".

[41]   ISO/IEC 646 (1991): "Information technology - ISO 7-bit coded character set for information interchange".

[42]   ISO/IEC 6429: "Information technology - Control functions for coded character sets".

[43]   ISO 8348 (1987): "Information technology -- Open Systems Interconnection -- Network Service Definition".

[44]   ITU-T Recommendation E.163: "Numbering plan for the international telephone service".

[45]   ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[46]   ITU-T Recommendation E.212: "The international identification plan for mobile terminals and mobile users".

[47]   ITU-T Recommendation F.69 (1993): "The international telex service - Service and operational provisions of telex destination codes and telex network identification codes".

[48]   ITU-T Recommendation I.330: "ISDN numbering and addressing principles".

[49]   ITU-T Recommendation I.440 (1989): "ISDN user-network interface data link layer - General aspects".

[50]   ITU-T Recommendation I.450 (1989): "ISDN user-network interface layer 3 General aspects".

[51]   ITU-T Recommendation I.500 (1993): "General structure of the ISDN interworking recommendations".

[52]   ITU-T Recommendation T.50: "International Alphabet No. 5".

[53]   ITU Recommendation Q.931: ISDN user-network interface layer 3 specification for basic control".

[54]   ITU-T Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".

[55]   ITU-T Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[56]   ITU-T Recommendation V.22bis: "2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[57]   Void.

[58]   ITU-T Recommendation V.26ter: "2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[59]   ITU-T Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[60]   ITU-T Recommendation V.110: "Support by an ISDN of data terminal equipments with V-Series type interfaces".

[61]   ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[62]   ITU-T Recommendation X.21: "Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for synchronous operation on public data networks".

[63]   Void.

[64]   Void.

[65]   ITU-T Recommendation X.30: "Support of X.21, X.21 bis and X.20 bis based Data Terminal Equipments (DTEs) by an Integrated Services Digital Network (ISDN)".

[66]   ITU-T Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".

[67]   Void.

[68]   Void.

[69]   ITU-T Recommendation X.121: "International numbering plan for public data networks".

[70]   ETSI ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".

[71]   ETSI ETS 300 102-2: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control; Specification Description Language (SDL) diagrams".

[72]   ISO/IEC 10646: "Information technology -- Universal Multiple-Octet Coded Character Set (UCS)".

[73]   3GPP TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".

[74]   3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".

[75]   3GPP TS 43.064: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2".

[76]   3GPP TS 44.060: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[77]   IETF RFC 1034: "Domain names - concepts and facilities.

[78]   3GPP TS 44.065: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[79]   ITU Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".

[80]   3GPP TS 26.111: "Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324".

[81]   3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".

[82]   3GPP TS 43.022: " Digital cellular telecommunications system (Phase 2+); Functions related to Mobile Station (MS) in idle mode and group receive mode".

[83]   3GPP TS 26.103: "Speech Codec List for GSM and UMTS".

[84]   3GPP TS 44.018: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol".

[85]   3GPP TS 48.008: "Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification".

[86]   3GPP TS 48.018: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)".

[87]   3GPP TS 43.055: "Dual Transfer Mode (DTM); Stage 2".

[88]   3GPP TS 23.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2"

[89]   3GPP TS 22.042: "Network Identity and Time Zone (NITZ), Stage 1".

[90]   3GPP TS 23.040: "Technical realization of Short Message Service (SMS)".

[91]   3GPP TS 44.056: "GSM Cordless Telephony System (CTS), (Phase 1) CTS Radio Interface Layer 3 Specification".

[92]   3GPP TS 23.226: "Global Text Telephony; Stage 2 "

[93]   3GPP TS 26.226: "Cellular Text Telephone Modem (CTM), General Description "

[94]   3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes"

[95]   3GPP TS 24.229: "3rd Generation Partnership Project; Technical Specification Group Core Network; IP Multimedia Call Control Protocol based on SIP and SDP"

[96]   3GPP TS 25.304: "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode"

Next modified section

4.2 Behaviour of the MS in MM Idle state, GMM-DEREGISTERED state and GMM-REGISTERED state

In this subclause, the detailed behaviour of the MS in the main states MM IDLE, GMM-DEREGISTERED and GMM-REGISTERED is described. Subclauses 4.2.1 to 4.2.3 refer to the state MM IDLE, whereas subclauses 4.2.4 and 4.2.5 refer to the states GMM-DEREGISTERED and GMM-REGISTERED, respectively.

The MM IDLE state is entered when none of the MM procedures are running and no RR connection exists. It is left when one of the MM procedures are triggered or a RR connection is established.

The specific behaviour in the MM IDLE state depends on the service state of the mobile station as described in subclause 4.1.2.1.2. The service state depends in particular on the update status which is defined in subclause 4.1.2.2.

How an appropriate service state is chosen after power on is described in subclause 4.2.1, and the specific behaviour of the mobile station in MM IDLE state is described in subclause 4.2.2. The service state chosen when the MM IDLE state is returned to from any state except NULL state is described in 4.2.3.

It should be noted that transitions between the various MM idle states are caused by (e.g.):

- results of procedures on RR connected mode (see subclause 4.2.3);

- insertion or removal of the SIM;

- cell selection/reselection (see also 3GPP TS 43.022 [82] and 3GPP TS 25.304 [96]);

- PLMN search;

- loss of coverage.

How various MM procedures affects the service state and the update status is described in the detailed descriptions of the procedures in subclauses 4.3 to 4.5.

4.2.1 Primary Service State selection

4.2.1.1 Selection of the Service State after Power On.

When mobility management is activated after power-on, the service state is 19.7 PLMN SEARCH. The detailed processing in this state is described in detail in 3GPP TS 23.122 [14], 3GPP TS 43.022 [82], and 3GPP TS 45.008 [34], and 3GPP TS 25.304 [96], where procedures for power on and selection of PLMN is described in detail. If the "Location update status" stored on the SIM is different from "updated", then the mobile shall act as if the "Location update status" stored on the SIM is "not updated".

The service state when the PLMN SEARCH state is left depends on the outcome of the search and on the presence of the SIM:

- if no cell has been found, the state is NO CELL AVAILABLE, until a cell is found;

- if no SIM is present the state is NO IMSI;

- if the mobile station has been continuously activated since loosing coverage and then returns to coverage, and if the selected cell is in the location area where the mobile station is registered and the timer T3212 has not expired, then the state is NORMAL SERVICE;

- if the selected cell is in the location area where the mobile station is registered and IMSI ATTACH is not required and timer T3212 has not expired, then the state is NORMAL SERVICE;

- if the mobile station is in automatic network selection mode and the selected cell is in a forbidden PLMN or a forbidden LA, then the mobile station enters the LIMITED SERVICE state;

- if the mobile station is in manual network selection mode and no cell of the selected PLMN has been found, then the mobile station enters the LIMITED SERVICE state;

- otherwise, the mobile station enters the LOCATION UPDATE NEEDED state.

Next modified section

4.2.3 Service state when back to state MM IDLE from another state

When returning to MM IDLE, e.g., after a location updating procedure, the mobile station selects the cell as specified in 3GPP TS 43.022 [82] and 3GPP TS 25.304 [96]. With one exception, this is a normal cell selection.

If this return to idle state is not subsequent to a location updating procedure terminated with reception of cause "Roaming not allowed in this location area" the service state depends on the result of the cell selection procedure, on the update status of the mobile station, on the location data stored in the mobile station and on the presence of the SIM:

- if no cell has been found, the state 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 state is NO IMSI;

- if the selected cell is in the location area where the MS is registered, then the state is NORMAL SERVICE; it shall be noted that this also includes an abnormal case described in subclause 4.4.4.9;

- (Only applicable for mobile stations supporting VGCS listening or VBS listening.) if the mobile stations was in the service state RECEIVING GROUP CALL (NORMAL SERVICE) or RECEIVING GROUP CALL (LIMITED SERVICE) before the location updating procedure and the selected cell is in the location area where the mobile station is registered, then the state is RECEIVING GROUP CALL (NORMAL SERVICE);

- if the selected cell is in a location area where the mobile station is not registered but in which the MS is allowed to attempt a location update, then the state is LOCATION UPDATE NEEDED;

- if the selected cell is in a location area where the mobile station is not allowed to attempt a location update, then the state is LIMITED SERVICE;

- (Only applicable for MSs supporting VGCS listening or VBS listening.) if the MSs was in the service state RECEIVING GROUP CALL (NORMAL SERVICE) or RECEIVING GROUP CALL (LIMITED SERVICE) before the location updating procedure and the selected cell is in the location area where the MS is not allowed to attempt a location update, then the state is RECEIVING GROUP CALL (LIMITED SERVICE);

- after some abnormal cases occurring during an unsuccessful location updating procedure, as described in subclause 4.4.4.9, the state is ATTEMPTING TO UPDATE.

In case of a return from a location updating procedure to which was answered "Roaming not allowed in this location area", the service state PLMN SEARCH is entered as specified in subclause 4.2.1.2.

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] and 3GPP TS 25.304 [96]);

- 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 [96] 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 [96].

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 [96]);

- 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 [96];

- 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 [96]; 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 [96].

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 [96];

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 [96];

- 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.

CHANGE REQUEST

⌘ **24.008** CR **632** ⌘ **rev** **1** ⌘ Current version: **5.3.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title: ⌘	DRX parameter update with RAU procedure	
Source: ⌘	Nokia	
Work item code: ⌘	TEI5	***Date:*** ⌘ 07.May.2002

Category: ⌘ **C**	***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)*

Reason for change: ⌘	The clause 4.7.5 does not allow MS to perform RAU procedure to update DRX parameter value. Some terminals may need to set different DRX parameter values for different applications. Signalling to do this is not specified inTS 24.008.
Summary of change: ⌘	MS may use routing area updating procedure to update the content of DRX parameter IE.
Consequences if not approved: ⌘	Terminals wishing to update DRX parameter value will send first a RAU REQUEST with the desired DRX parameter value and a changed MS Radio Access Capability IE, followed by another RAU REQUEST setting the MS Radio Access Capability IE back to original.

Clauses affected: ⌘	4.7.5
Other specs Affected: ⌘	☐ Other core specifications ⌘ ☐ 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/3G_Specs/CRs.htm. Below is a brief summary:

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

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

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

4.7.5 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 or DRX parameter 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.

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".