

**3GPP TSG CN Plenary  
Meeting #11, Palm Springs, U.S.A Rev.  
14<sup>th</sup> - 16<sup>th</sup> March 2001**

**Tdoc NP-010206  
[from Tdoc NP-010157]**

**Source:** TSG CN WG 1  
**Title:** CRs to Rel-4 on Work Item TEI-4  
**Agenda item:** 8.16  
**Document for:** APPROVAL

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**Introduction:**

This document contains 2 CRs on **Rel-4** Work Item "TEI-4", that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #11 for approval.

<b>Tdoc</b>	<b>Title</b>	<b>Spec</b>	<b>CR#</b>	<b>Re v</b>	<b>CAT</b>	<b>Rel</b>	<b>C_Ver</b>
N1-010428	Missing SMR state	24.011	022		F	Rel-4	3.5.0
N1-010444	Adaptation of SS protocol to PS domain	24.007	031	3	B	Rel-4	3.6.0

## CHANGE REQUEST

⌘ **24.011 CR 022** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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  Radio Access Network  Core Network

<b>Title:</b>	⌘	Missing SMR state	
<b>Source:</b>	⌘	TSG_CN WG1	
<b>Work item code:</b>	⌘	TEI	<b>Date:</b> ⌘ 26/02/01
<b>Category:</b>	⌘	F	<b>Release:</b> ⌘ Rel-4
		<p><i>Use <u>one</u> of the following categories:</i></p> <p><b>F</b> (essential correction)  <b>A</b> (corresponds to a correction in an earlier release)  <b>B</b> (Addition of feature),  <b>C</b> (Functional modification of feature)  <b>D</b> (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>	<p><i>Use <u>one</u> of the following releases:</i></p> <p><b>2</b> (GSM Phase 2)  <b>R96</b> (Release 1996)  <b>R97</b> (Release 1997)  <b>R98</b> (Release 1998)  <b>R99</b> (Release 1999)  <b>REL-4</b> (Release 4)  <b>REL-5</b> (Release 5)</p>

<b>Reason for change:</b>	⌘	The SMR state "Wait to send RP-ACK" is missing in the description of the SMR protocol in the MS side.
<b>Summary of change:</b>	⌘	<p>The description of the missing SMR state "Wait to send RP-ACK (State 3)" has been introduced.</p> <p>Furthermore, some editorial errors have been corrected.</p>
<b>Consequences if not approved:</b>	⌘	The SMR protocol is not consistently described. The description of the SMR state "Wait to send RP-ACK" at the MS side is inconsistent within the normative part and between in the normative part of the spec and the informative SDL diagrams in the appendix.

<b>Clauses affected:</b>	⌘	See attached CR
<b>Other specs affected:</b>	⌘	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications
<b>Other comments:</b>	⌘	

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- 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://www.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

# Overview of Short Message Service (SMS) support

The purpose of the Short Message Service is to provide the means to transfer messages between a GSM PLMN Mobile Station (MS) and a Short Message Entity via a Service Centre, as described in 3GPP TS 23.040. The terms "MO" - Mobile Originating - and "MT" - Mobile Terminating - are used to indicate the direction in which the short message is sent.

The present document describes the procedures necessary to support the Short Message Service between the MS and the MSC or SGSN and vice versa, as described in 3GPP TS 23.040.

The procedures are based on services provided by the Mobility Management sublayer as described in 3GPP TS 24.007/24.008 for CS in A/Gb mode and CS/PS services in Iu mode and the Logical Link Control layer described in 3GPP TS 04.64 for GPRS services.

## 2.1 Protocols and protocol architecture

In Iu mode only, integrity protected signalling (see 3GPP TS 24.008, subclause 'Integrity Protection of Signalling Messages,' and in general, see 3GPP TS 33.102) is mandatory. In Iu mode only, all protocols shall use integrity protected signalling. Integrity protection of all SMS signalling messages is the responsibility of lower layers. It is the network which activates integrity protection. This is done using the security mode control procedure (3GPP TS 25.331).

The hierarchical model in Figure 2.1a shows the layer structure of the MSC and the MS. The hierarchical model in Figure 2.1c shows the layer structure of the SGSN and the MS in Iu mode.

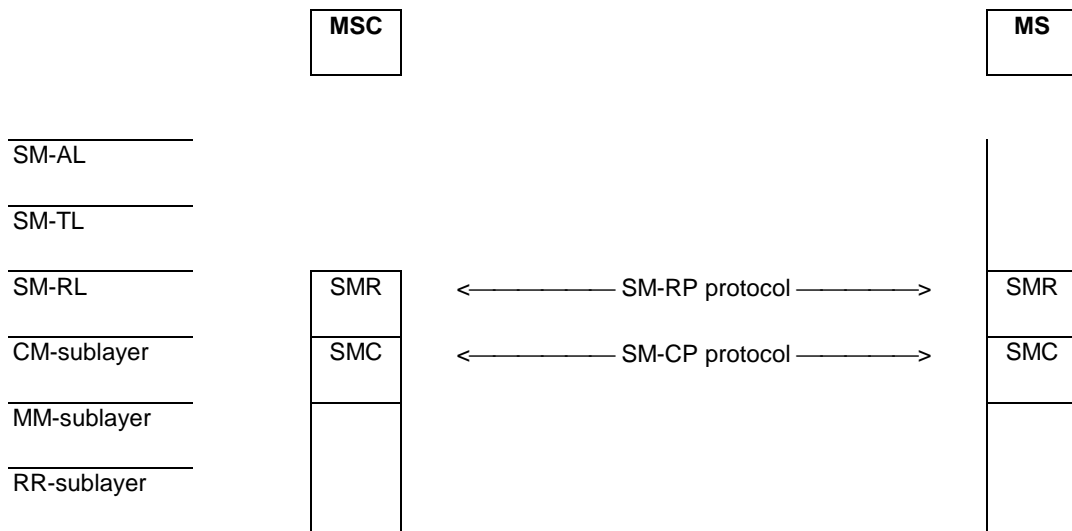


Figure 2.1a/3GPP TS 24.011: Protocol hierarchy for circuit switched service

The hierarchical model in Figure 2.1b shows the layer structure of the SGSN and the MS in A/Gb mode.

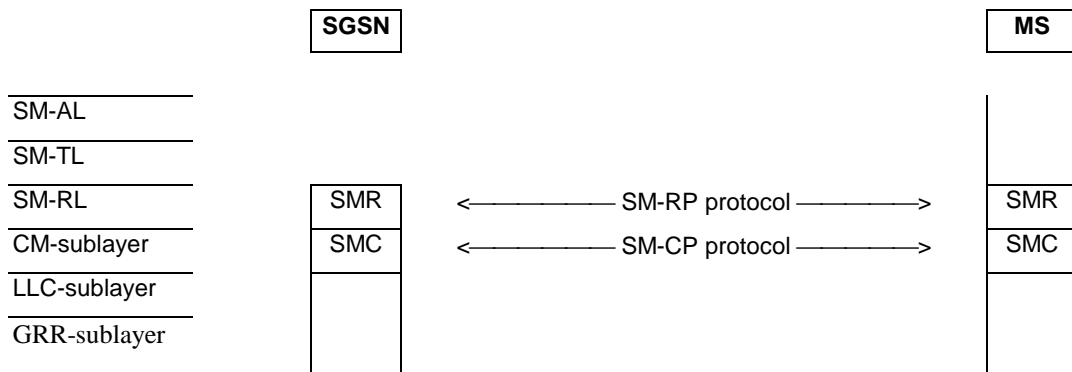
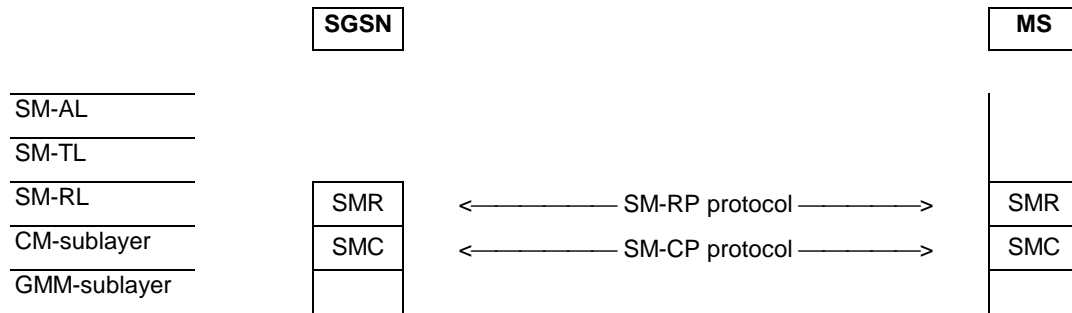


Figure 2.1b/3GPP TS 24.011: Protocol hierarchy for GPRS in A/Gb mode



**Figure 2.1c/24.011: Protocol hierarchy for packet switched service in lu mode**

The CM-sublayer, in terms of the Short Message Service Support, provides services to the Short Message Relay Layer.

On the MS-side the Short Message Relay Layer provides services to the Short Message Transfer Layer. The Short Message Relay Layer is the upper layer on the network side (MSC or SGSN), and the SM-user information elements are mapped to TCAP/MAP.

The peer protocol between two SMC entities is denoted SM-CP, and between two SMR entities, SM-RP.

Abbreviations:

SM-AL	Short Message Application Layer
SM-TL	Short Message Transfer Layer
SM-RL	Short Message Relay Layer
SM-RP	Short Message Relay Protocol
SMR	Short Message Relay (entity)
CM-sub	Connection Management sublayer
SM-CP	Short Message Control Protocol
SMC	Short Message Control (entity)
MM-sub:	Mobility Management sublayer
GMM-sub:	GPRS Mobility Management sublayer
RR-sub:	Radio Resource Management sublayer
LLC-sub	Logical Link Control sublayer
GRR-sub	GPRS Radio Resource sublayer in GSM

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

## 2.4 Layer 2 (LLC) GPRS support (A/Gb mode only)

It shall be possible for a GPRS-attached MS of any class (A, B, C) to send and receive short messages over GPRS radio channels.

GPRS shall use the unacknowledged mode of LLC frame transfer as described in 3GPP TS 04.64, and shall use SAPI 7 to identify the SMS Logical Link Entity within the LLC layer.

A description of the different GPRS MS classes can be found in 23.060, and a brief overview is given below:-

- Class A/B MSs may be able to send and receive short messages using either the MM sublayer (using SACCH or SDCCH) or the LLC layer (using PDTCH).
- Class C MSs may be able to send and receive short messages using only the LLC layer (using the PDTCH). The capability for GPRS-attached class-C MSs to receive and transmit SMS messages is optional.

The GSMS entity for GPRS class A/B MS is shown in Figure 2.2. The GSMS shall communicate with the MM entity via the GMMSMS-SAP for GPRS Class A/B MO SMS, in order to ascertain which transport service to use.

SMS delivery via GPRS is normally a more radio resource efficient method than SMS delivery via CS in A/Gb mode. The delivery path for MO SMS is selected by the MS.

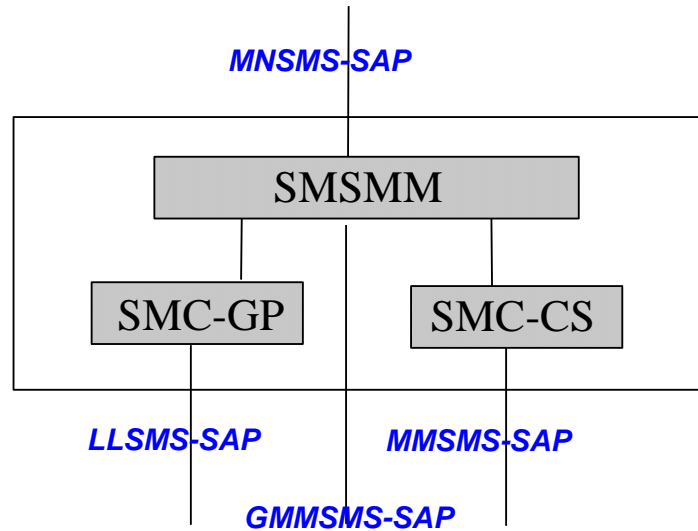


Figure 2.2/3GPP TS 24.011: GSMS entity for GPRS Class A/B MS

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

## 6.2 Transition states of SMR entity

The state transition diagram for the SMR entities on both MS-side and network side are contained in annex D.

### 6.2.1 SMR-states at the MS-side of the radio interface

The states described in this subclause are for a SMR entity in a MS, handling mobile originating- and mobile terminating short messages and notification transfer.

#### 6.2.1.1 Idle (State 0)

This state exists when the SMR entity is in idle mode, or when a short message or notification transfer ends in a normal or abnormal way.

#### 6.2.1.2 Wait for RP-ACK (State 1)

This state exists for mobile originating short message or notification transfer when the SMR has passed the RP-DATA or RP-SMMA to the SMC entity and set the timer TR1M.

#### 6.2.1.2a Wait to send RP-ACK (State 3)

This state exists for mobile terminating short message transfer. The SMR entity will enter this state after passing a received RP-DATA message to TL and setting the timer TR2M.

#### 6.2.1.3 Wait for RETRANS TIMER (State 4)

This state exists for memory available notification when the SMR is waiting to retransmit the RP-SMMA message. Timer TRAM has been set. The possibility of an abort of the sending of the memory available notification by the SM-TL exists. No underlying connection exists.

## 6.2.2 SMR-states at the network side of the radio interface

The states described in this subclause are for a SMR entity in a MSC, handling mobile originating- and mobile terminating short message and notification transfer.

### 6.2.2.1 Idle (State 0)

This state exists when the SMR entity is in idle mode, or when a short message transfer or notification end in a normal or abnormal way.

### 6.2.2.2 Wait for RP-ACK (State 1)

This state exists for a mobile terminating short message transfer when the SMR has passed the RP-DATA message to the SMC entity and set the timer TR1N.

### 6.2.2.3 Wait to send RP-ACK (State 3)

This state exists for mobile originating short message or notification transfer. The SMR entity will enter this state after passing a received RP-DATA or RP-SMMA message to TL and setting the timer TR2N.

## 6.3 Short Message Relay procedures

The procedures needed for short message and notification relaying are:

- TP Data Unit (TPDU) relay procedures;
- notification relay procedures;
- procedures for abnormal cases.

### 6.3.1 TPDU relaying

When the SMR entity is in the Idle state and receives a request from SM-TL to relay a TPDU, it forms and transfers the RP-DATA message (containing the TPDU), sets the timer TR1\* and enters the state Wait for RP-ACK.

Retransmission of RP data units by the CM-sublayer is described in clause 5.

When the SMR entity is in the "Wait for RP-ACK" state, the following situations may occur:

- a) reception of an RP-ACK or RP-ERROR message (containing the same reference number as the transmitted RP-DATA message);
- b) reception of an error indication from the CM-sublayer;
- c) the timer TR1\* expires.

In case a) or b), the timer TR1\* is reset, a report indication is passed to SM-TL, a request to release the CM-connection is passed to CM-sublayer, and the SMR entity enters the Idle state.

In case c), a request to abort the CM-connection is passed to the CM-sublayer, a report indication is passed to SM-TL, and the SMR entity enters the Idle state.

When the SMR entity is in the Idle state and receives an MNSMS-EST-Ind containing a valid RP-DATA message, it passes the SMS-TPDU to the SM-TL, starts timer TR2\*, and enters the state "Wait to Send RP-ACK".

When the SMR entity is in the state "Wait to Send RP-ACK" and the SMR entity receives the SM-RL-Report-Request, the timer TR2\* is reset, the RP-message (RP-ACK or RP-ERROR) is generated and relayed to the peer entity, a CM-connection release request is passed to the CM-sublayer, and the SMR entity enters the Idle state.

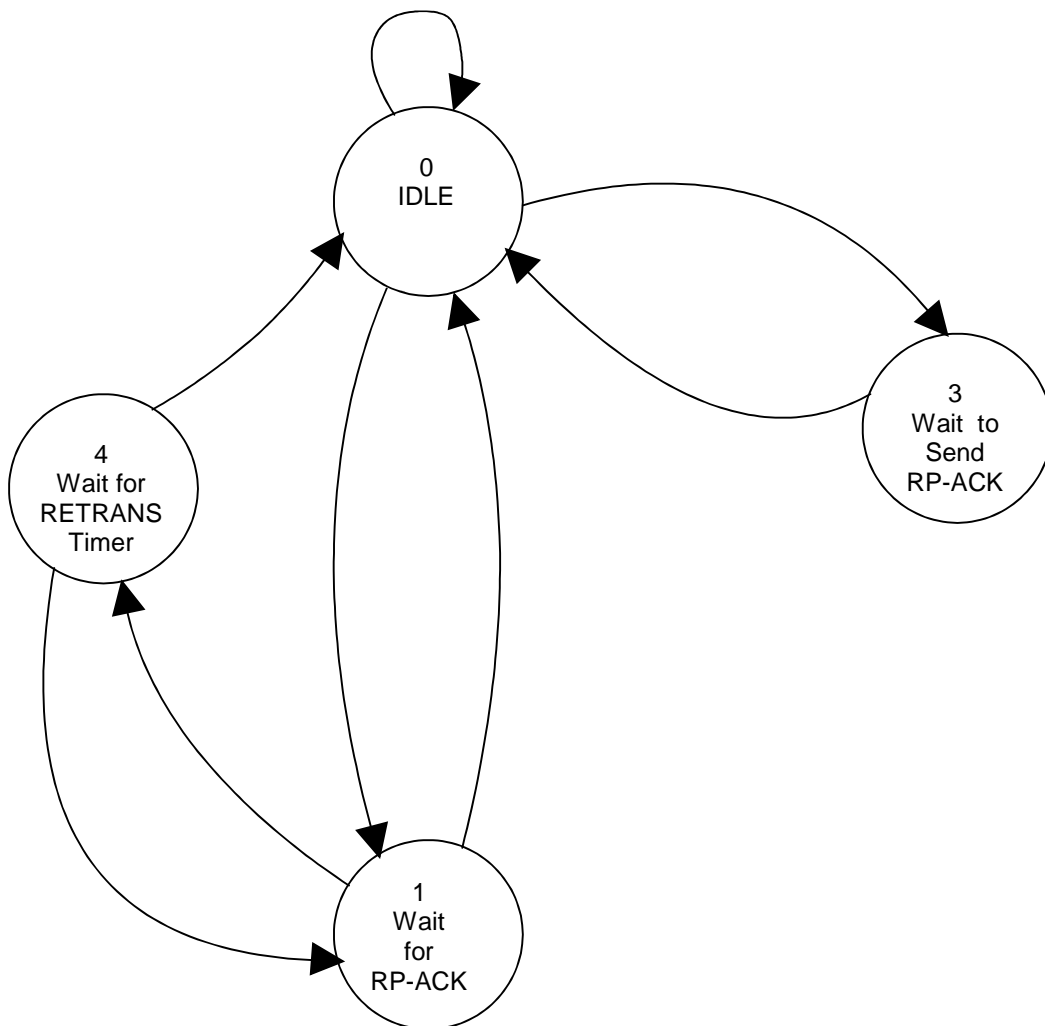
When the SMR entity is in the state "Wait to Send RP-ACK" and the SMR entity receives an error indication from the CM-sublayer, the timer TR2\* is reset, a report indication is passed to the SM-TL and the SMR entity enters the Idle state.

When the SMR entity is in the state "Wait to send RP-ACK" and the timer TR2\* expires, the SMR entity passes a CM-connection abort request to the CM-sublayer, a report indication is passed to the SM-TL, and the SMR entity enters the Idle state.

REFERENCE (for information only):

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Annex D (normative):  
SDL-description of the short message relay layer



**SMR-entity on MS-side  
State transition diagram**



CR-Form-v3

## CHANGE REQUEST

⌘ **24.007 CR 31** ⌘ rev **3** ⌘ Current version: **3.6.0** ⌘

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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Adaptation of SS protocol to PS domain		
<b>Source:</b>	⌘ TSG_CN WG1		
<b>Work item code:</b>	⌘ LCS1-PS	<b>Date:</b>	⌘ 27/Feb/2001
<b>Category:</b>	⌘ <b>B</b> Critical correction	<b>Release:</b>	⌘ REL-4
	<i>Use <u>one</u> of the following categories:</i> <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use <u>one</u> of the following releases:</i> <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>REL-4</b> (Release 4) <b>REL-5</b> (Release 5)

<b>Reason for change:</b>	⌘ Supplementary Service protocol is applied to PS domain to support LCS.		
<b>Summary of change:</b>	⌘ The SS entity become to use the PS domain transport capability adding two new SAPs below: <ul style="list-style-type: none"> <li>- GMMSS-SAP: This SAP provides service to transport the SS PDU via PS domain. The required functionality to this SAP is same as GMMSSM-SAP so that they are reused with the necessary renaming.</li> <li>- GMMSS2-SAP: This SAP provides service to check the MM and the GMM status to select which domain to use for mobile originating SS procedure. The required functionality to this SAP is same as GMMSSM-SAP so that they are reused with the necessary renaming. Note that this SAPI exists only in the mobile station side.</li> </ul>		
<b>Consequences if not approved:</b>	⌘		

<b>Clauses affected:</b>	⌘ 5.2, 9.5.x, 9.5.y, 10.5.x		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	24.010, 24.030
<b>Other comments:</b>	⌘ Modification in CR 032 to 24.007(N1-010083) is incorporated since same figure (Fig. 5.6) is targeted to update.		

**How to create CRs using this form:**

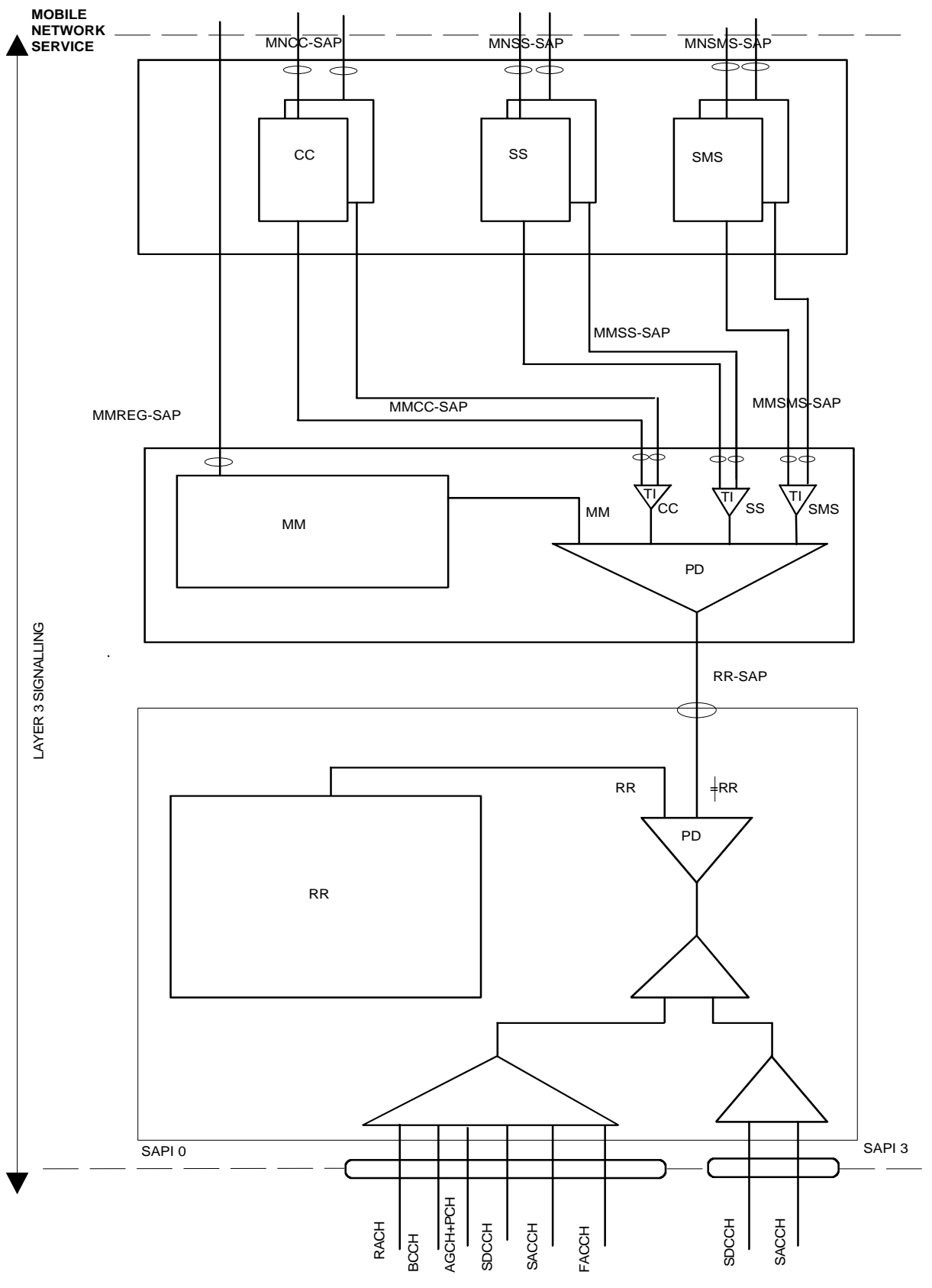
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## 5.2 Protocol architecture

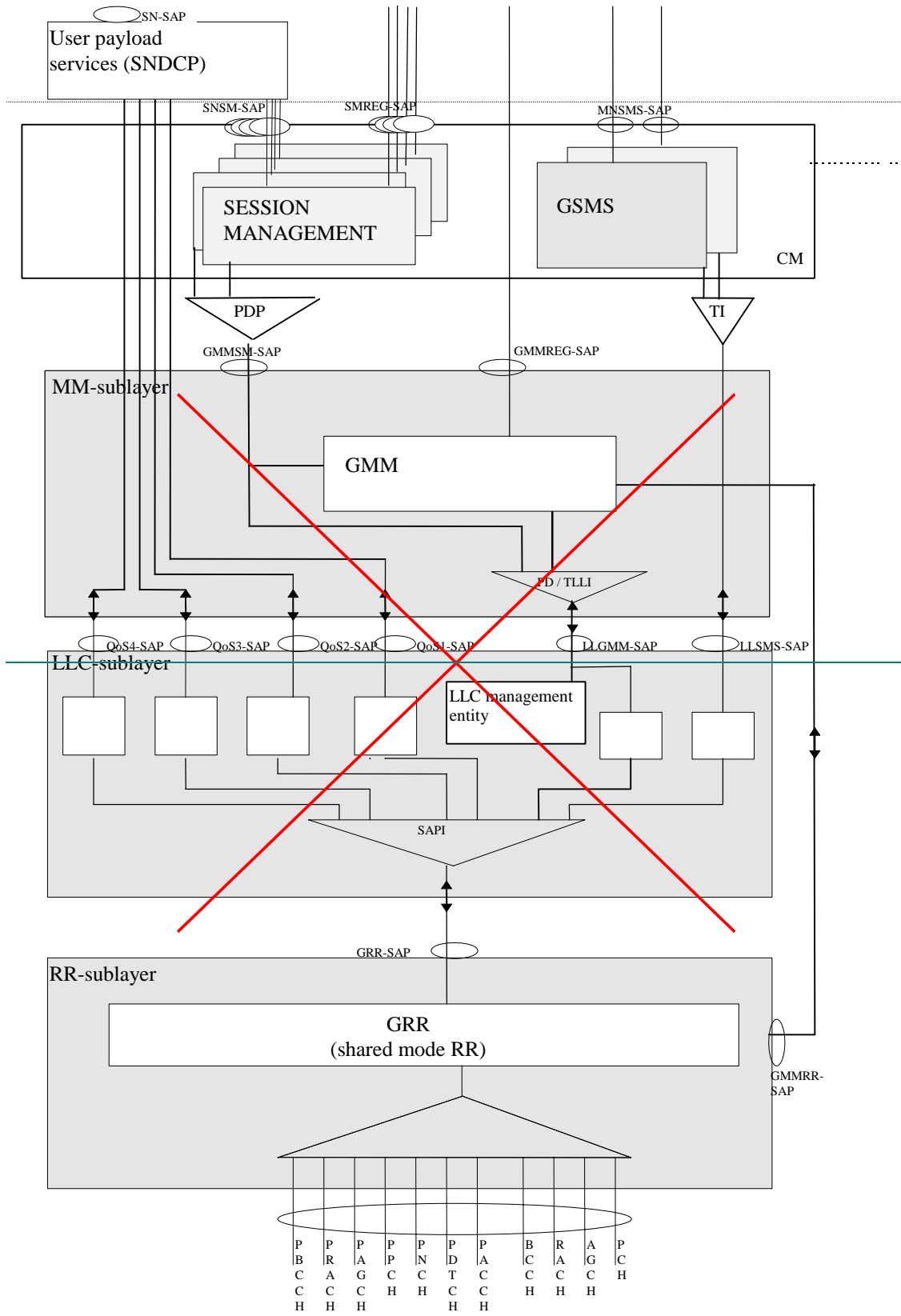
The protocol architecture is visualised for each of the three models:

- Figure 5.1/3GPP TS 24.007 shows the protocol architecture for a MS not supporting the GPRS service, restricting the representation of CM sublayer protocols to four paradigmatic examples, CC, LCS, SS, and SMS. Note that the protocol stack for a class C GPRS service may be present in the MS, but it is not active simultaneously.
- Figure 5.2 shows the protocol architecture for a MS supporting the Class C GPRS service. (Note that the protocol stack for a circuit switched services may be present in the MS, but it is not active simultaneously).
- Figure 5.3 shows the protocol architecture for non-GPRS and GPRS-services supporting Class A and Class B MSs.
- Figure 5.4 shows the protocol architecture for a MS supporting CTS services in addition to non-GPRS services.
- Figure 5.5 shows the protocol architecture for a MS supporting the PS mode of operation UMTS service.
- Figure 5.6 shows the protocol architecture for UMTS services supporting CS/PS mode of operation MSs.



**Figure 5.1: Protocol Architecture not supporting GPRS service - MS side**

NOTE: Figure 5.1 shall be updated to include the new PD for LCS in the same manner as the other PDs are shown.



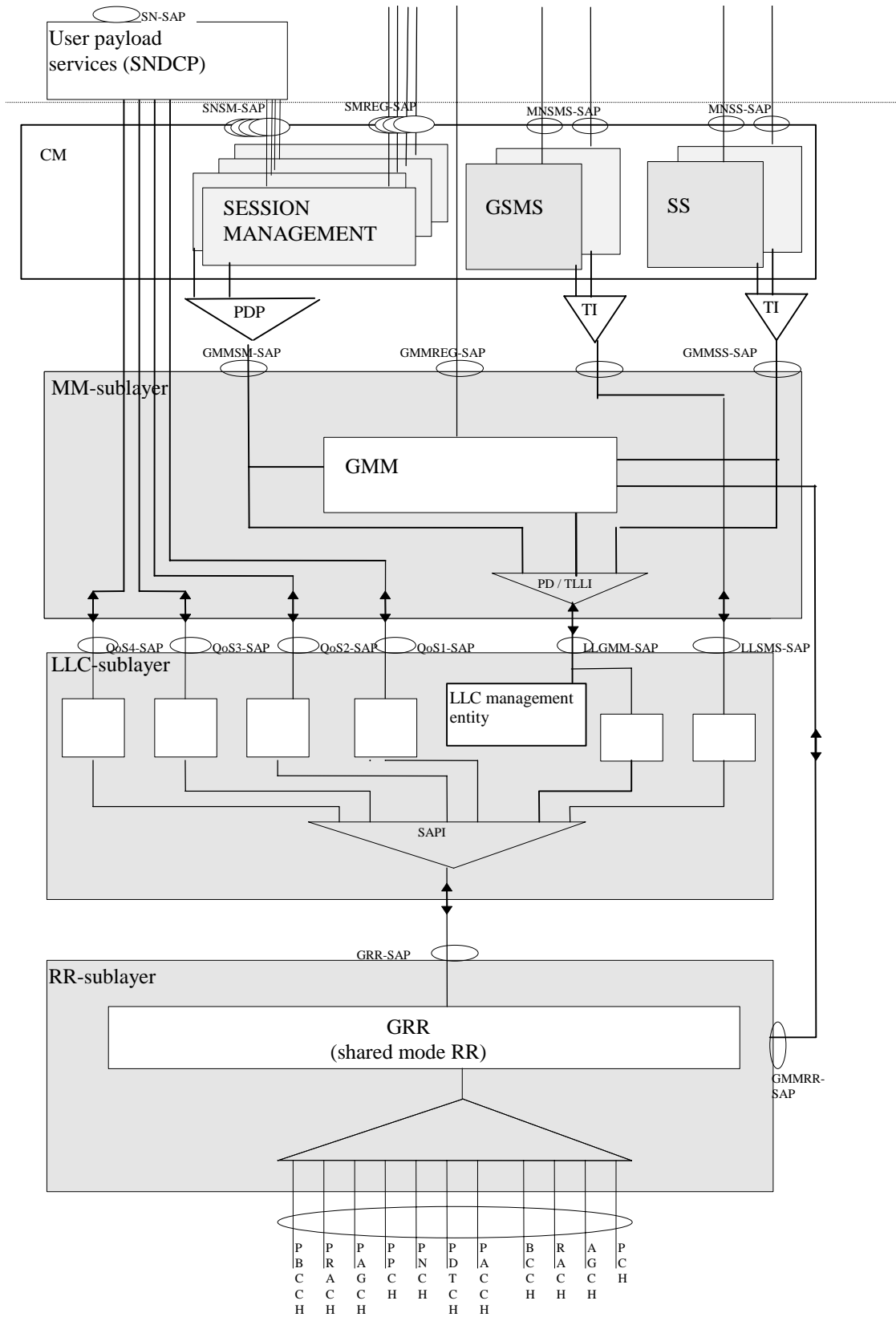
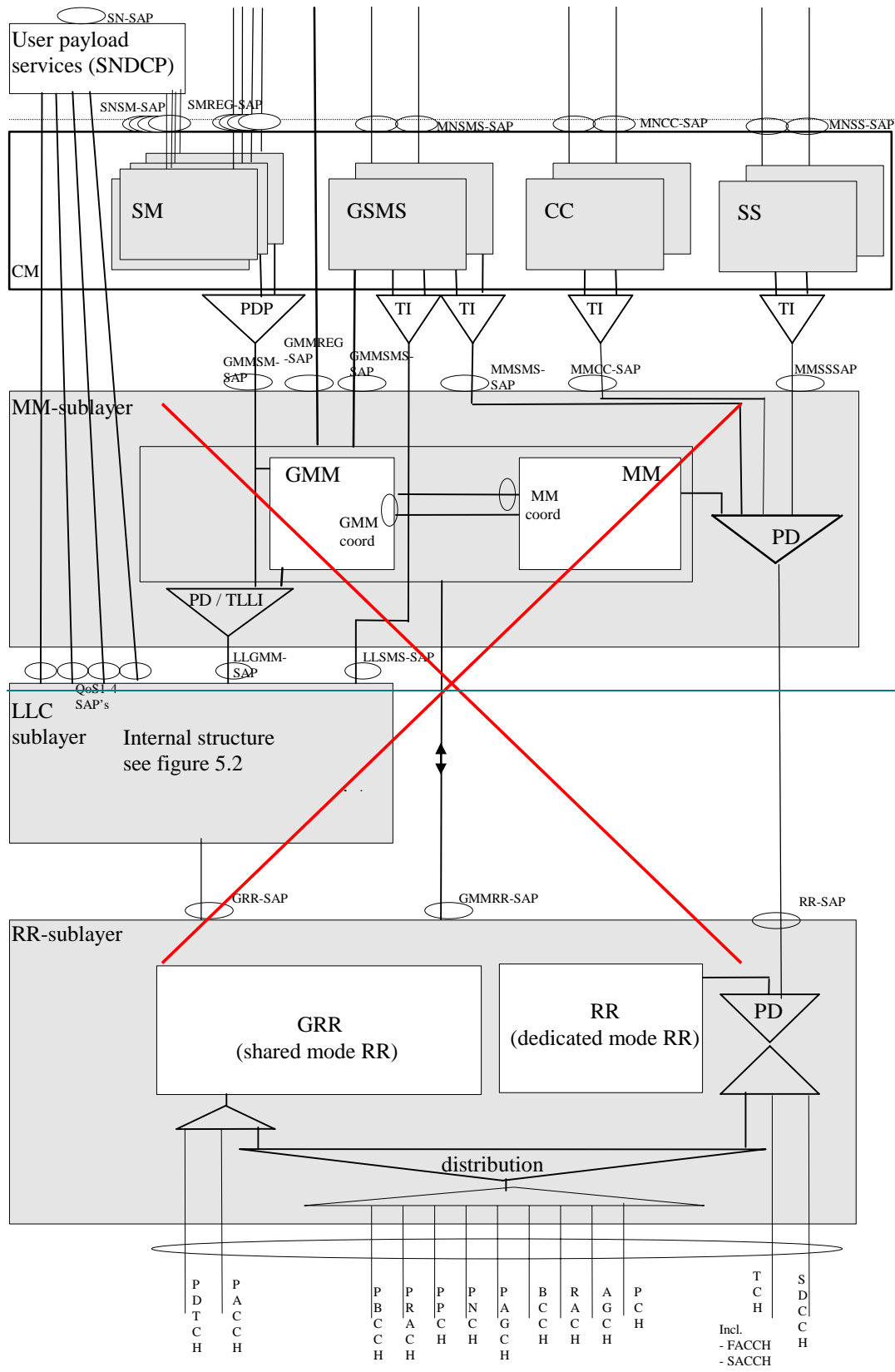


Figure 5.2: Protocol architecture supporting GPRS class C MSs, MS - side



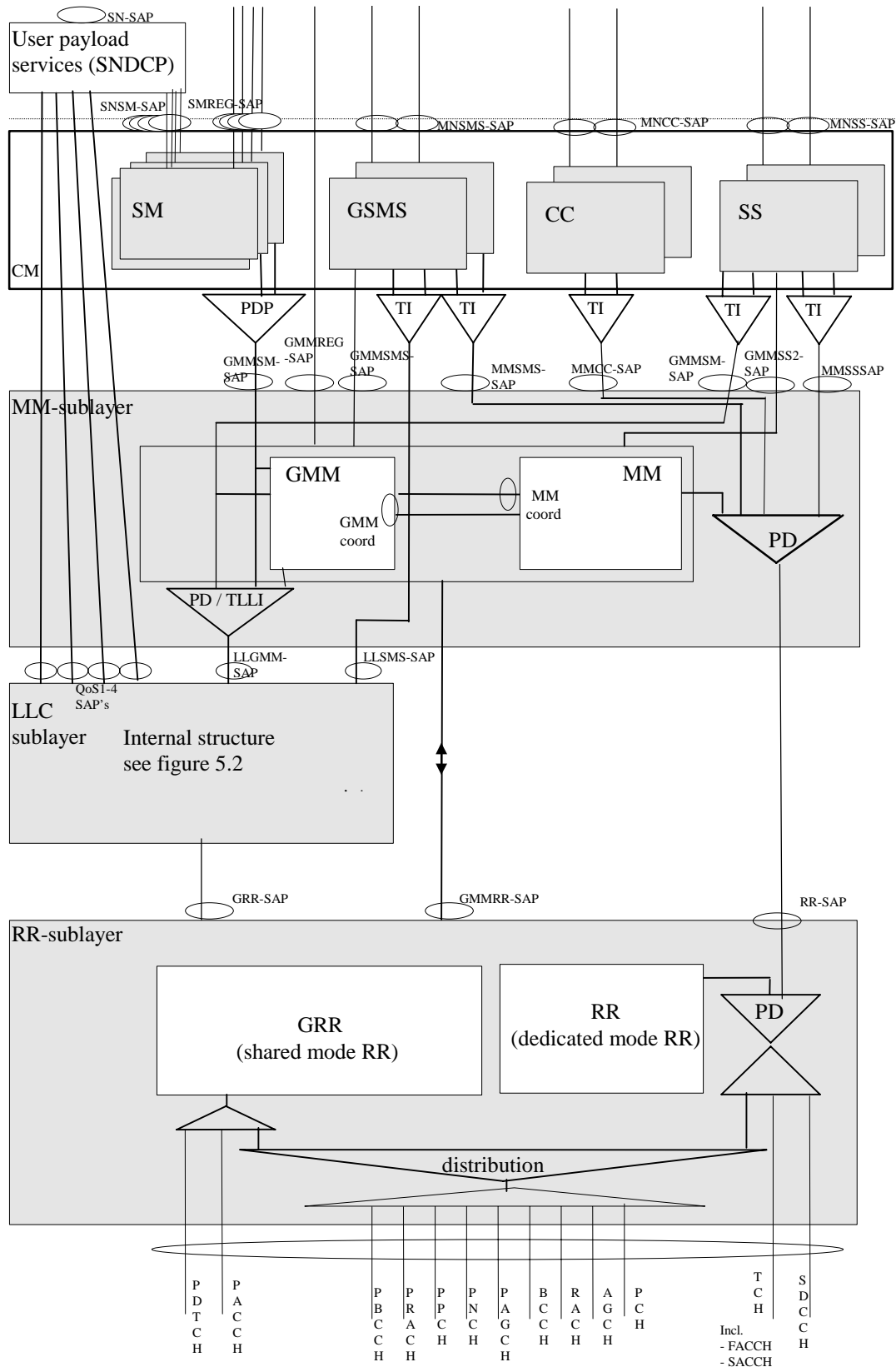


Figure 5.3/3GPP TS 24.007: Protocol architecture supporting GPRS class A and B MSs, MS - side



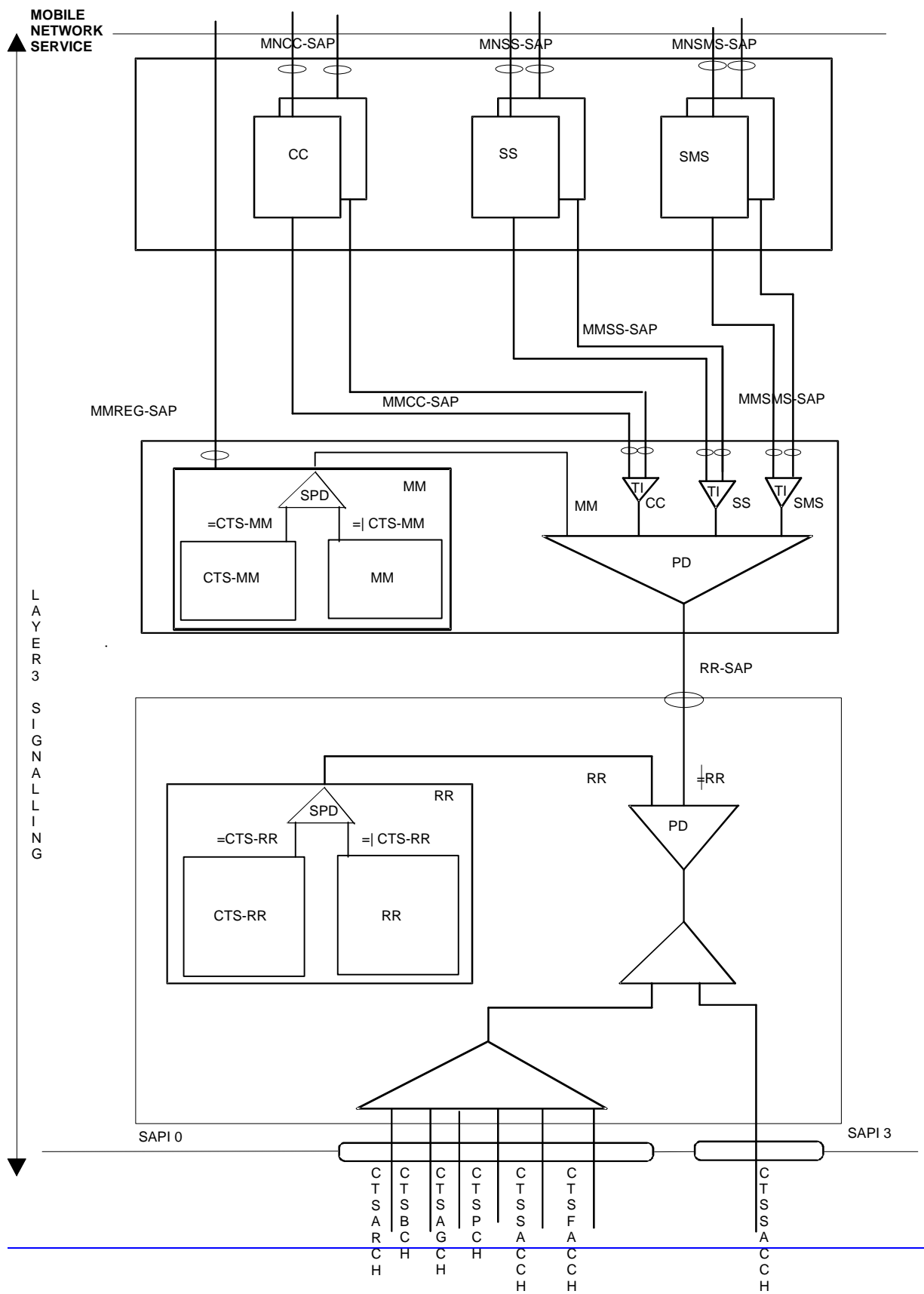


Figure 5.4/3GPP TS 24.007: Protocol architecture supporting CTS services in addition to non- GPRS services, MS - side

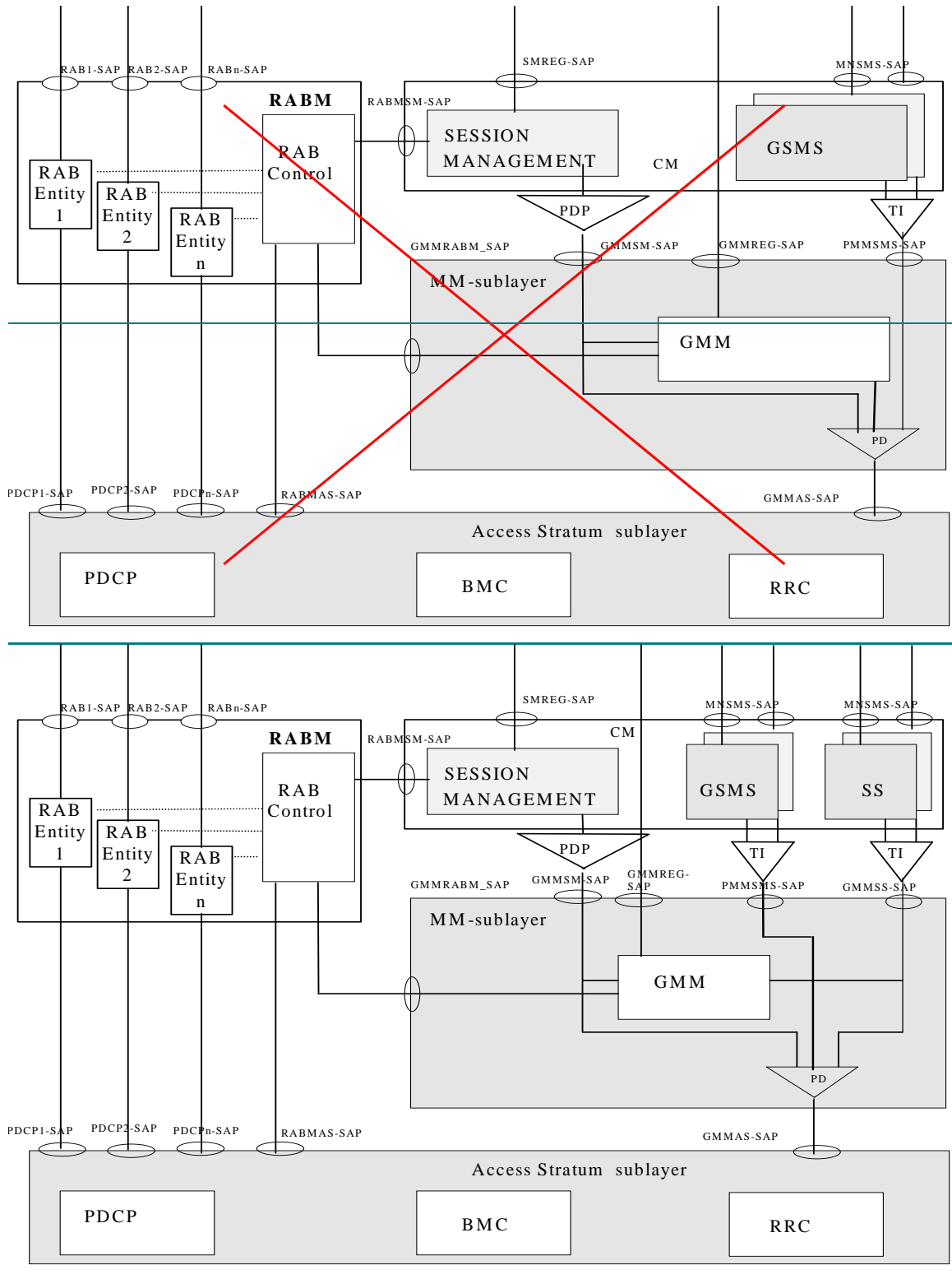
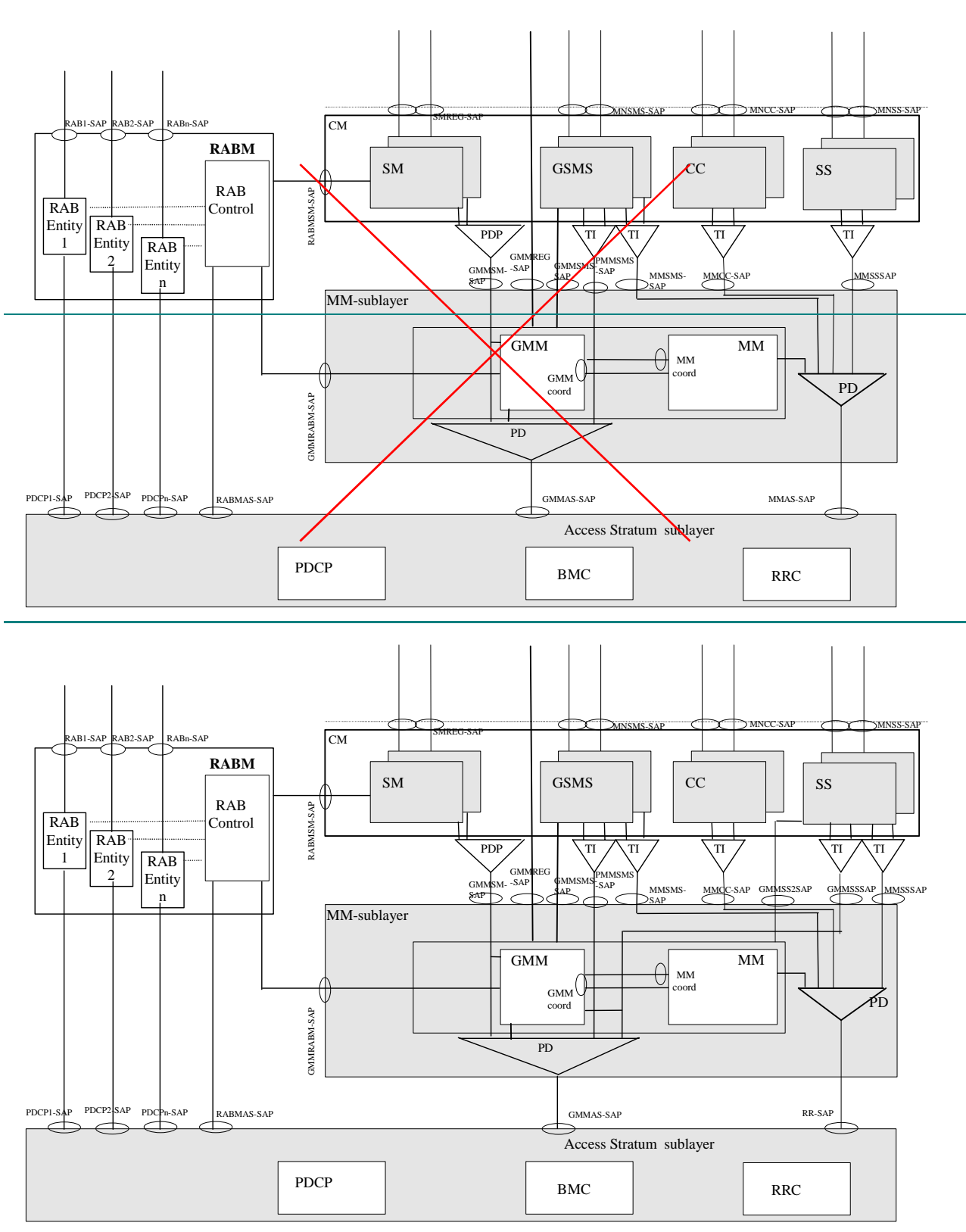


Figure 5.5 Protocol architecture of Non Access Stratum supporting PS mode of operation MSs, MS-side



**Figure 5.6/24.007: Protocol architecture of Non Access Stratum supporting CS/PS mode of operation MSs, MS – side**

NOTE: SMS un-related parts of this figure, e.g. SNDCP should be modified for UMTS

As shown in figure 5.1 a hierarchy of 3 sublayers is defined:

- the RR sublayer provides services to the MM sublayer and utilizes the services of signalling layer 2;
- the MM sublayer provides common services to the entities of the Connection Management (CM) sublayer;
- the CM sublayer includes, among others, the CC, SS, and SMS entities, which are independent entities.

Figure 5.2 defines four sublayers for GPRS services supporting Class C MSs:

- the RR sublayer provides services to the MM and LLC sublayers;
- the LLC sublayer provides services to the MM sublayer, the SNDCP and GSMS entities and uses services of the RR sublayer;
- the MM sublayer provides services to the SM and SS entities of the CM. The MM sublayer includes one GMM;
- the CM sublayer includes the SM, SS and GSMS entities. The SM entity provides services to the SNDCP entity and uses services of the MM sublayer. The GSMS entity is identical to the SMS entity for non-GPRS services except it uses the services from the LLC sublayer. The SS entity is identical to the one for non-GPRS services except it uses the services from the GPRS lower layer LLC or PS signalling connection.

Figure 5.3 defines four sublayers for non-GPRS and GPRS-services supporting Class A and Class B MSs:

- the RR sublayer provides services to the MM and LLC sublayers;
- the LLC sublayer provides services to the MM sublayer, the SNDCP and GSMS entities and uses services of the RR sublayer;
- the MM sublayer provides services to the SNDCP entity and to the entities of the Connection Management (CM) sublayer. In addition to the MM entity for non-GPRS services, the MM sublayer further includes one GMM entity;
- the CM sublayer includes, among others, the CC, SS, GSMS and SM entities, which are independent entities.
- The SM entity provides services to the SNDCP entity and uses services of the MM sublayer. The GSMS entity is an extension of the SMS entity for non-GPRS services. For message transfer it uses the services both from the LLC sublayer and the MM entity of the MM sublayer. Furthermore it retrieves from the MM entity information about which transport service to use.

Figure 5.4 defines three sub-layers for CTS services:

- the RR sublayer provides services (including CTS services) to the MM sublayer and uses the services of signalling layer 2;
- the MM sublayer provides common services to the entities of the Connection Management (CM) sublayer; it provides also specific CTS services to the entities above CM;
- the CM sublayer includes, among others, the CC, SS, and SMS entities, which are independent entities.

Figure 5.5 defines three sublayers for UMTS PS domain services supporting PS mode of operation:

- the Access Stratum (AS) sublayer provides services to the MM sublayer and the RAB Manager (RABM) entity.
- the MM sublayer provides services to the SM, SS-entities and GSMS entities of the CM. The MM sublayer includes one GMM entity;
- the CM sublayer includes the SM, SS and GSMS entities. The SM entity provides services to the RABM entity and uses services of the MM sublayer. The GSMS entity is identical to the SMS entity for GPRS services in GSM except it uses the services from the GMM sublayer. The SS entity is identical to the one for non-GPRS services except it uses the services from the GPRS lower layer LLC or PS signalling connection.
- The RABM hides the concepts of RABs that can be activated /released while a PDP context is active. If UL data in the terminal is to be sent on a RAB (NSAPI) that has been released the RABM will trigger a service request procedure in GMM.

Figure 5.6 defines three sublayers for UMTS CS domain services and UMTS PS domain services supporting CS/PS mode of operation MSs:

- the Access Stratum (AS) sublayer provides services to the MM sublayer and the RAB Manager (RABM) entity.
- the MM sublayer provides services to the entities of the Connection Management (CM) sublayer. In addition to the MM entity for CS domain services, the MM sublayer further includes one GMM entity;
- the CM sublayer includes, among others, the CC, SS, GSMS and SM entities, which are independent entities;
- The SM entity provides services to the RABM entity and uses services of the MM sublayer. The GSMS entity is an extension of the SMS entity for CS domain services. For message transfer it uses the services both from the GMM entity of the MM sublayer and the MM entity of the MM sublayer. Furthermore it retrieves from the MM entity information about which transport service to use.
- The RABM hides the concepts of RABs that can be activated /released while a PDP context is active. If UL data in the terminal is to be sent on a RAB (NSAPI) that has been released, the RABM will trigger a service request procedure in GMM.

## 9.5 Services provided by the GMM for GPRS services

The GPRS Mobility Management (GMM) sublayer provides services to the Session Management (SM) entity, [Supplementary Service \(SS\) entity](#) and the Short Message Service Support (GSMS) entity for message transfer.

### 9.5.x Service primitives for GMMSS-SAP

[Supplementary Services may request GPRS service registration before sending SS PDU.](#)

**Table 9.5.x: Primitives and parameters at GMMSS-SAP - MS side**

<u>PRIMITIVE</u>	<u>PARAMETER</u> ( <a href="#">message</a> , <a href="#">info elements of message</a> , <a href="#">other parameters</a> )	<u>REFERENCE</u>
<a href="#">GMMSS-ESTABLISH-REQ</a>	=	<a href="#">9.5.x.1</a>
<a href="#">GMMSS-ESTABLISH-CNF</a>	=	<a href="#">9.5.x.2</a>
<a href="#">GMMSS-ESTABLISH-REJ</a>	<a href="#">cause</a>	<a href="#">9.5.x.3</a>
<a href="#">GMMSS-RELEASE-IND</a>	=	<a href="#">9.5.x.4</a>
<a href="#">GMMSS-UNITDATA-REQ</a>	<a href="#">SS-PDU</a>	<a href="#">9.5.x.5</a>
<a href="#">GMMSS-UNITDATA-IND</a>	<a href="#">SS-PDU</a>	<a href="#">9.5.x.6</a>

#### 9.5.x.1 GMMSS-ESTABLISH-REQ

[Request from Supplementary Services to send an ATTACH REQUEST message to the network to setup a GMM connection. The request is only performed in case the MS is not already attached. The GPRS attach is then indirectly caused by a sending of SS PDU.](#)

#### 9.5.x.2 GMMSS-ESTABLISH-CNF

[The network has send the ATTACH ACCEPT message to the MS, the indirect attach was successful. Now Supplementary Services can proceed with sending SS PDU.](#)

#### 9.5.x.3 GMMSS-ESTABLISH-REJ

[The network has rejected the attach. The MS has received the ATTACH REJECT message.](#)

#### 9.5.x.4 GMMSS-RELEASE-IND

[The GPRS mobility management informs the Supplementary Services that the MS has been GPRS detached, e.g. by timer expiry.](#)

### 9.5.x.5 GMMSS-UNITDATA-REQ

The GMM is requested to forward a SS PDU to lower layer in order to send it to the peer entity.

### 9.5.x.6 GMMSS-UNITDATA-IND

The GMM forwards a SS PDU, which has been received from the peer entity.

## 9.5.y Service primitives for GMMSS2-SAP

The Supplementary Service entity may request to the MM and/or GMM entity the MM and/or GMM IMSI registration state before an SS PDU transmission is initiated from the mobile station.

**Table 9.5.y: Primitives and parameters at GMMSS2-SAP - MS side**

<u>PRIMITIVE</u>	<u>PARAMETER</u> (message, info elements of message, other parameters)	<u>REFERENCE</u>
<u>GMMSS2-REG-STATE-REQ</u>	=	<u>9.5.y.1</u>
<u>GMMSS2- REG-STATE -RSP</u>	<u>Registration state</u>	<u>9.5.y.2</u>

### 9.5.y.1 GMMSS2-REG-STATE-REQ

Request for the current IMSI registration state from the Supplementary Services entity.

### 9.5.y.2 GMM SS2- REG-STATE -RSP

The current IMSI registration state is sent to the Supplementary Services entity.

## 10.5.x Service primitives for GMMSS-SAP

**Table 10.5.x: Primitives and Parameters at GMMSS-SAP - network side**

<u>PRIMITIVE</u>	<u>PARAMETER</u> (message, info elements of message, other parameters)	<u>REFERENCE</u>
<u>GMMSS-RELEASE-IND</u>	=	<u>10.5.x.1</u>
<u>GMMSS-UNITDATA-REQ</u>	<u>SS-PDU</u>	<u>10.5.x.2</u>
<u>GMMSS-UNITDATA-IND</u>	<u>SS-PDU</u>	<u>10.5.x.3</u>

### 10.5.x.1 GMMSS-RELEASE-IND

The GPRS mobility management informs the Supplementary service that the MS has been GPRS detached, e.g. by timer expiry.

### 10.5.x.2 GMMSS-UNITDATA-REQ

The GMM is requested to forward a SS PDU to lower layer in order to send it to the peer entity.

### 10.5.x.3 GMMSS-UNITDATA-IND

The GMM forwards a SS PDU, which has been received from the peer entity.