3GPP TSG-CN Meeting #24 **NP-040185**
2nd – 4th June 2004. Seoul, Korea.

Source: **TSG CN WG 1**

Title: **CRs to R99 (with mirror CRs) on Work Item LCS towards 24.007 and 24.008**

Agenda item: **7.4**

Document for: **APPROVAL**

Introduction:

This document contains **8** CRs, **R99** Work Item **"LCS"**, that have been agreed by **TSG CN WG1 in CN1#34 meeting**, and are forwarded to TSG CN Plenary meeting #24 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Doc-2nd-Level
24.007	060	1	R99	Corrections concerning the use of the LCS protocol	F	3.9.0	N1-040964
24.007	061	1	Rel-4	Corrections concerning the use of the LCS protocol	A	4.2.0	N1-040965
24.007	062	1	Rel-5	Corrections concerning the use of the LCS protocol	A	5.1.0	N1-040966
24.007	063	1	Rel-6	Corrections concerning the use of the LCS protocol	A	6.0.0	N1-040967
24.008	853	1	R99	Clarification of the use of service type 'Location services'	F	3.18.0	N1-040968
24.008	854	1	Rel-4	Clarification of the use of service type 'Location services'	A	4.13.0	N1-040969
24.008	855	1	Rel-5	Clarification of the use of service type 'Location services'	A	5.11.0	N1-040970
24.008	856	1	Rel-6	Clarification of the use of service type 'Location services'	A	6.4.0	N1-040971

3GPP TSG-CN1 Meeting #34
Zagreb, Croatia 10 – 14 May 2004

Tdoc N1-040964
(rev of Tdoc N1-040805)

CR-Form-v7

CHANGE REQUEST

⌘ **24.007** **CR** **060** ⌘ **rev** **1** ⌘ Current version: **3.9.0** ⌘

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

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

Title:	⌘	Corrections concerning the use of the LCS protocol
Source:	⌘	Siemens AG
Work item code:	⌘	LCS ***Date:*** ⌘ 27.04.2004
Category:	⌘	**F** ***Release:*** ⌘ R99

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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	With LS S2-041015 (N1-040527), SA2 asked for a clarification about the 'nature of location services' and the protocols involved in the signalling for location services. Closer inspection of TS 24.007 showed that the specification contains some inconsistencies with regard to the use of the LCS protocol entity and the protocol discriminators LCS and SS: In some places it needs to be clarified that the LCS entity is only present in a type A LMU (e.g. subclause 4.1 and 6.8), and that the protocol discriminator LCS is only used by these LMUs (e.g. clause 11). The reference to the supplementary service procedures to be used by the MS for location services is missing (clause 2, subclause 4.3.4). It is erroneously stated that an MS uses the LCS protocol when initiating positioning measurements (subclause 6.8). It is erroneously stated that the type A LMU uses the supplementary service protocol instead of the LCS protocol (subclause 10.2.1).
Summary of change:	⌘	Necessary clarifications are added and wrong statements corrected. The text of the notes under figures 5.1, 9.3, and 10.3 which required "(this) figure … shall be updated …" is changed, since apparently this update will not happen.
Consequences if not approved:	⌘	Inconsistent specification which may cause wrong implementations. If the MS uses PD = LCS instead of PD = SS when initiating a mobile originating location request, the request cannot be treated by the network.

Clauses affected:	⌘	2, 4.1, 4.3.4, 5.2, 6.8, 6.8.1, 6.8.2, 7, 7.6, 9.2, 10.2, 10.2.1, 10.2.2, 11.2.3.1.1, 11.2.3.2.1, 11.2.3.2.2			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	
			X Test specifications		
			X O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

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

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

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

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

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] GSM 01.02(R97): "Digital cellular telecommunications system (Phase 2+); General description of a GSM Public Land Mobile Network (PLMN)".

[1a] 3GPP TS 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.101: "General UMTS Architecture".

[3] 3GPP TS 04.01: "Mobile Station - Base Station System (MS - BSS) interface General aspects and principles".

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

[3b] GSM 03.56(R98): "Digital cellular telecommunications system (Phase 2+); GSM Cordless Telephony System (CTS), phase 1; CTS Architecture Description; Stage 2".

[3c] 3GPP TS 03.71: "Location Services (LCS) Functional Description; Stage 2".

[3d] 3GPP TS 23.171: "Functional stage 2 description of location services in UMTS".

[4] 3GPP TS 04.05: "Data Link (DL) layer General aspects".

[5] 3GPP TS 04.06: "Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".

[5a] 3GPP TS 04.14: “ndividual equipment type requirements and interworking; Special conformance testing functions”.

[6] 3GPP TS 24.008: "Mobile radio interface layer 3 specification Core Network Protocols-Stage 3".

[6a] 3GPP TS 23.108: "Mobile Radio Interface Layer 3 specification Core Network Protocols stage 2 (structured procedures)".

[6b] 3GPP TS 04.18: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[7] 3GPP TS 24.010: "Mobile radio interface layer 3 Supplementary services specification General aspects".

[8] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[8a] 3GPP TS 04.71: "Location Services (LCS); Mobile radio interface layer 3 specification".

[9] 3GPP TS 24.080: "Mobile radio interface layer 3 supplementary services specification Formats and coding".

[10] 3GPP TS 24.081: "Line identification supplementary services - Stage 3".

[10a] 3GPP TS 04.60: "General Packet Radio Services (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control and medium Access Control (RLC/MAC) layer specification".

[10b] 3GPP TS 04.56: "GSM Cordless Telephony System (CTS), phase 1; CTS Radio Interface Layer 3 specification".

[11] 3GPP TS 24.082: "Call Forwarding (CF) supplementary services - Stage 3".

[11a] 3GPP TS 04.64: "General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification".

[12] 3GPP TS 24.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3".

[12a] 3GPP TS 04.65: "General Packet Radio Service (GPRS); Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[13] 3GPP TS 24.084: "MultiParty (MPTY) supplementary services - Stage 3".

[14] 3GPP TS 24.085: "Closed User Group (CUG) supplementary services - Stage 3".

[15] 3GPP TS 24.086: "Advice of Charge (AoC) supplementary services - Stage 3".

[16] 3GPP TS 24.088: "Call Barring (CB) supplementary services - Stage 3".

[17] 3GPP TS 24.090: "Unstructured supplementary services operation (USSD)- Stage 3".

[17a] 3GPP TS 34.109: “Terminal logical test interface; Special conformance testing functions”.

[18] ITU-T Recommendation X.200: "Reference Model of Open systems interconnection for ITU-T Applications".

[19] 3GPP TS 04.68: "Group Call Control (GCC) Protocol".

[20] 3GPP TS 23.110: "UMTS Access Stratum Services and Functions".

[21] 3GPP TS 24.030: "Location Services (LCS); Supplementary service operations – Stage 3".

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

4 Introduction

4.1 General

Three models are defined for Layer 3, one model for non-GPRS services, one for GPRS services supporting Class C MSs only and one model for GPRS-services supporting Class A and Class B MSs. (The third model is a combination of the first two models listed).

The layer 3 for non-GPRS services provides the functions necessary:

- for Radio Resource (RR) management;
- for Mobility Management (MM); and
- for the Connection Management (CM) functions, i.e. functions for the control, provision, and support of services offered by the network; among which there are, e.g.:
  - the functions to establish, maintain and terminate circuit-switched connections across a GSM PLMN and other networks to which the GSM PLMN is connected;
  - supporting functions for supplementary services control;
  - supporting functions for short messages service control;
  - supporting functions for location services control (only for a type A LMU).

The layer 3 for non-GPRS services is composed of three sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (MM) functions; and
- the Connection Management (CM) functions.

When CTS services are added to non-GPRS services, the following functions are added:

- CTS Radio Resource Management (CTS-RR) functions to RR; and
- CTS Mobility Management (CTS-MM) functions to MM.

The layer 3 for GPRS services is composed of four sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (GMM);
- for the Logical Link Control (LLC);
- the Connection Management (CM) functions;

The Connection Management (CM) sublayer is composed of functional blocks for:

- Call Control (CC) for non-GPRS services;
- Short Message Service Support (SMS) for non-GPRS services;
- GPRS Short Message Service Support (GSMS) (for GPRS services supporting Class A, B and C MSs);
- Session Management (SM) (for GPRS services supporting Class A, B and C MSs);
- Supplementary Services Support (SS) for non-GPRS services;
- Group Call Control for non-GPRS services;
- Broadcast Call Control (BCC) for non-GPRS services;
- Connection Management of Packet Data on Signalling channels for non-GPRS services.
- Location Services support (LCS) for non-GPRS services (only for a type A LMU).

Within the context of LCS, for GSM LCS, the services defined for an MS are equally applicable to a type A LMU, unless otherwise stated. However, services defined specifically for a type A LMU are not applicable to an MS. The following is a list of services essential for a type A LMU.

The layer 3 for non-GPRS services provides the functions necessary:

- for Radio Resource (RR) management;
- for Mobility Management (MM); and
- supporting functions for location service control.

The layer 3 for non-GPRS services is composed of three sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (MM) functions; and
- the Connection Management (CM) functions.

The Connection Management (CM) sublayer is composed of functional block for:

- location services support (LCS) for non-GPRS services.

The present document does not consider the distribution of signalling functions among the different network

equipments. The signalling functions are described between two systems which represent the MS side and the network side of the radio interface of layer 3. Only the functions in the network for signalling communication with one MS is considered.

For GPRS services, in addition to the signalling functions also the user data transfer is included in this Technical Specification.

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

4.3.4 Contents of layer 3 related Technical Specifications

- The Radio Resource (RR) management protocol is defined in 3GPP TS 04.18 [6b]:
- the Mobility Management (MM) protocol is defined in 3GPP TS 24.008;
- the Session Management (SM) protocol is defined in 3GPP TS 24.008;
- the Call Control (CC) protocol is defined in 3GPP TS 24.008;
- the Supplementary Services (SS) protocol is defined in 3GPP TS 24.010 [7], 3GPP TS 24.08x, ~~and~~ 3GPP TS 24.09x, and 3GPP TS 24.030 [21];
- the Short Message Service (SMS) protocol is defined in 3GPP TS 24.011 [8];
- the Group Call Control (GCC) protocol is defined in 3GPP TS 04.68 [19];
- the Logical Link Control (LLC) protocol is defined in 3GPP TS 04.64 [11a];
- the GPRS Radio Resource (GRR) protocol is defined in 3GPP TS 04.60 [10a] and 3GPP TS 24.008 [6];
- the CTS Radio Resource (CTS-RR) sub-protocol is defined in 3GPP TS 04.56 [10b];
- the CTS Mobility Management (CTS-MM) sub-protocol is defined in 3GPP TS 04.56 [10b];
- the CTS additions to the Call Control (CC) protocol are defined in 3GPP TS 04.56 [10b];
- the Location Services (LCS) protocol for a type A LMU is defined in 3GPP TS 03.71[3c], 23.171 [3d] and 3GPP TS 04.71 [8a].

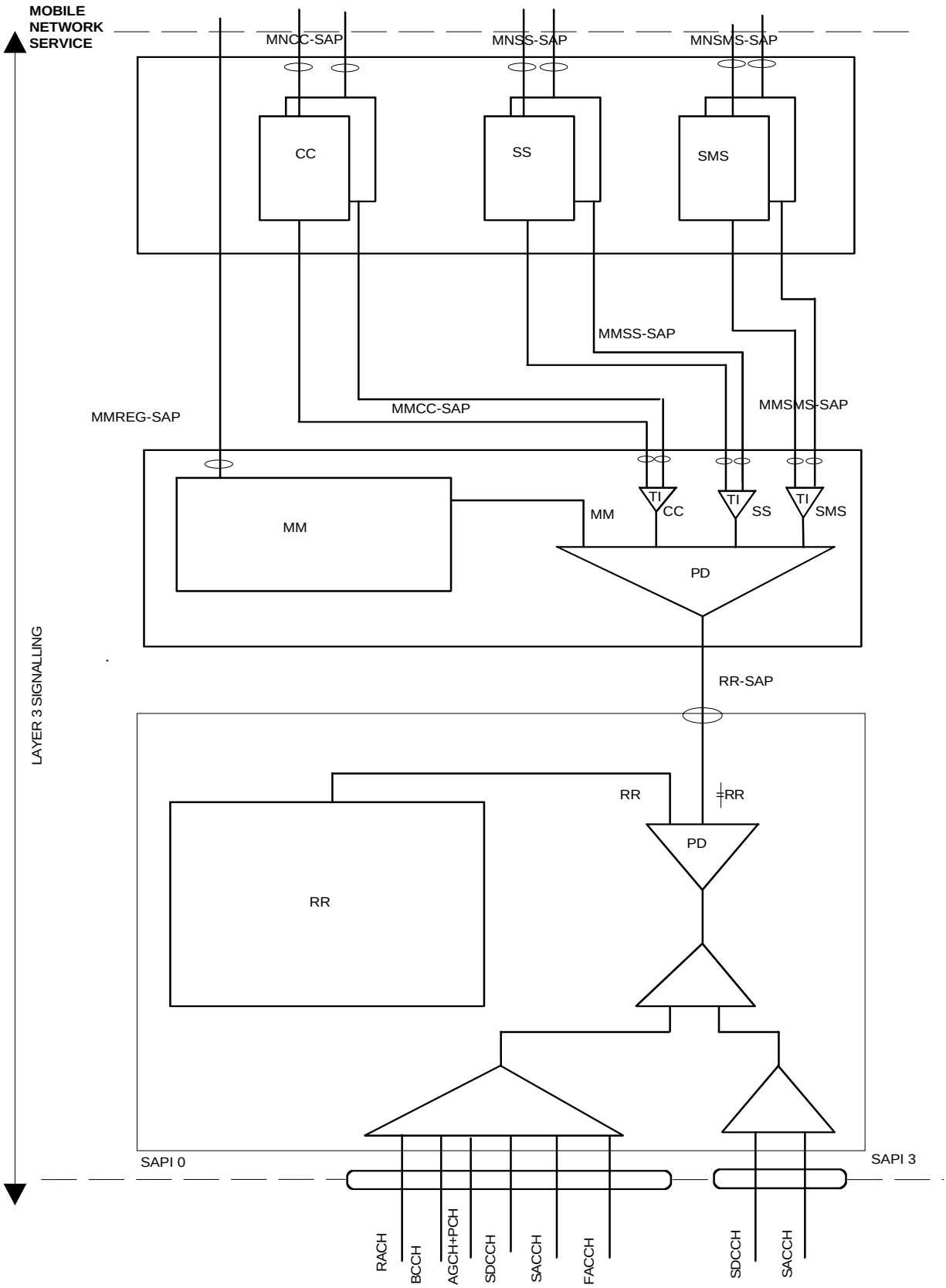
********** NEXT MODIFIED SECTION **********

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 three~~four~~ paradigmatic examples, CC, ~~LCS,~~ SS, and SMS. The LCS protocol entity of a type A LMU would be included in the same manner. 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.



NOTE: The LCS protocol entity for a type A LMU would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

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.~~

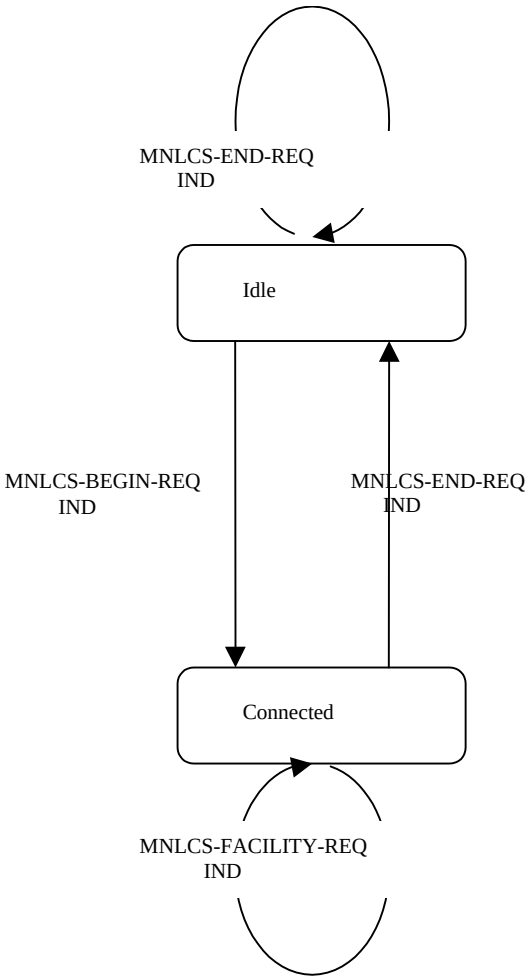
********** NEXT MODIFIED SECTION **********

6.8 Location services at the ~~MS~~type A LMU side

The location services (~~initiation of positioning measurements at the MS~~e.g. transfer of timing related measurement information by a type A LMU) are provided at the service access point MNLCS-SAP. The service provided by the CM sublayer to support the location services is defined in 3GPP TS 04.71 [8a].

6.8.1 Service state diagram

The positioning services provided at the service access point MNLCS-SAP are illustrated in the state diagram of figure 6.8.



STATES:
IDLE - No LCS signalling transaction pending.
CONN - LCS signalling transaction established.

Figure 6.8: Service graph of the Location Services Support entity - ~~MS~~type A LMU side

6.8.2 Service primitives

Table 6.8: Primitives and Parameters at MNLCS-SAP - ~~MS~~type A LMU side

PRIMITIVES	PARAMETERS (Info elements of message)	REFERENCE
MNLCS_BEGIN_REQ	REGISTER	6.8.2.1
MNLCS_BEGIN_IND	REGISTER	6.8.2.2
MNLCS_FACILITY_REQ	FACILITY	6.8.2.3
MNLCS_FACILITY_IND	FACILITY	6.8.2.4
MNLCS_END_REQ	RELEASE COMPLETE	6.8.2.5
MNLCS_END_IND	RELEASE COMPLETE	6.8.2.6

6.8.2.1 MNLCS_BEGIN_REQ

Request to send a REGISTER message in order to establish a signalling transaction for the provision of location services. The request for transfer of a location service facility may be included.

6.8.2.2 MNLCS_BEGIN_IND

Receipt of a REGISTER message, a signalling transaction is established for the provision of location services after receipt of a REGISTER message. The indication of a location service facility may be included.

6.8.2.3 MNLCS_FACILITY_REQ

Request to send a FACILITY message for the provision of a location service invocation. The request for transfer of a location service facility may be included.

6.8.2.4 MNLCS_FACILITY_IND

Receipt of a FACILITY message, a location service facility has been requested.

6.8.2.5 MNLCS_END_REQ

Request to send a RELEASE COMPLETE message in order to release the signalling transaction. The request for transfer of a location service facility may be included.

6.8.2.6 MNLCS_END_IND

Receipt of a RELEASE COMPLETE message, the signalling transaction has been released. The indication of a location service facility may be included.

7 Services provided by signalling layer 3 on the Network side

In this clause, the services provided by signalling layer 3 on the network side are described which belong to the CM sub-layer functional blocks of CC, SMS, LCS, and SS. The services corresponding to further functional blocks of the CM sublayer are not further described in this clause.

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

7.6 Location services at the Network side

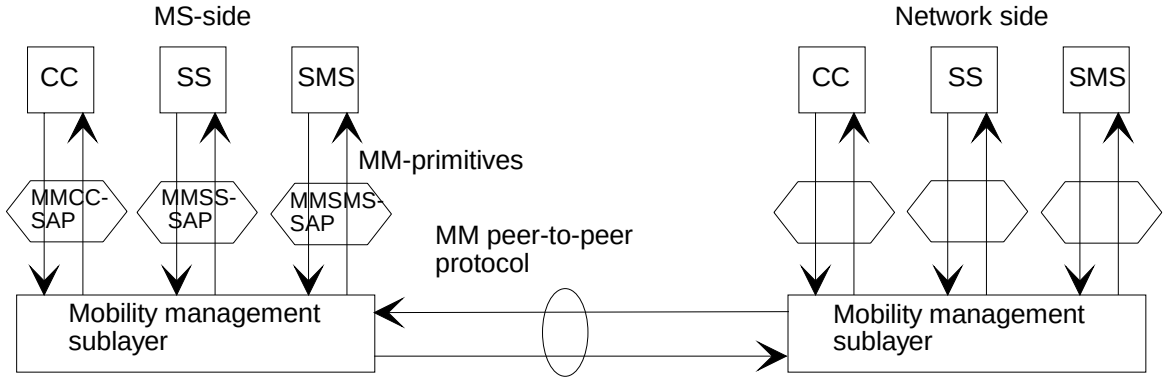
The location services (e.g. network initiation of timing related ~~location~~ measurements in a type A LMU~~at the network~~) are provided at the service access point MNLCS-SAP. The service provided by the CM sublayer to support the location services is defined in 3GPP TS 04.71 [8a] (for communication with a type A LMU only).

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

9.2 Services provided by the Mobility Management entity

The Mobility Management (MM) sublayer provides services to the Call Control (CC) entity, the Supplementary Services Support (SS) entity, the Location Services (LCS) entity (only for type A LMU) and the Short Message Service Support (SMS) entity.

The Mobility Management services primitives are discriminated by the MMCC, MMSS, MMLCS and MMSMS prefix.



NOTE: The LCS protocol entities for communication between a type A LMU and the network would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

Figure 9.3: Services provided at the MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - MS side

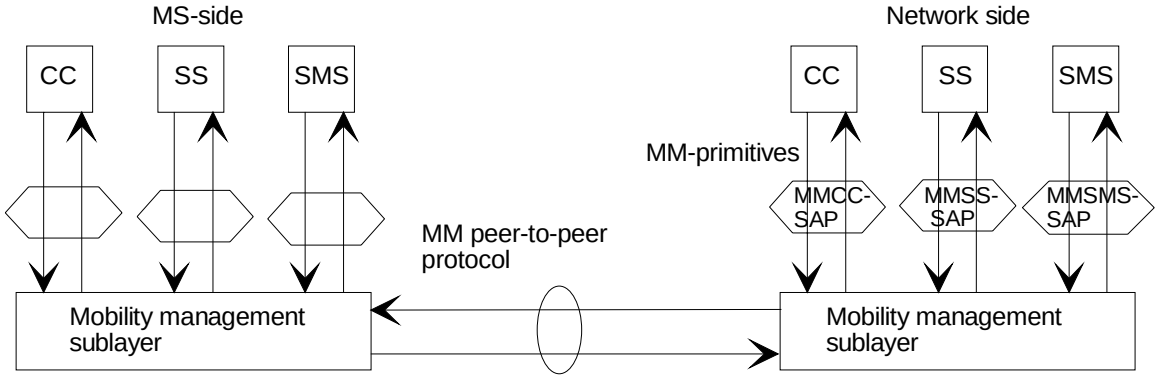
~~NOTE: Figure 9.3 shall be updated to include the LCS PD in the same manner as the other PDs are shown.~~

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

10.2 Services provided by the Mobility Management entity

The Mobility Management (MM) sublayer provides services to the Call Control (CC) entity, the Supplementary Service Support (SS) entity, the Location Services (LCS) (for type A LMU) and the Short Message Service Support (SMS) entity.

The Mobility Management services primitives are recognized by the MMCC, MMSS, MMLCS and MMSMS prefix.



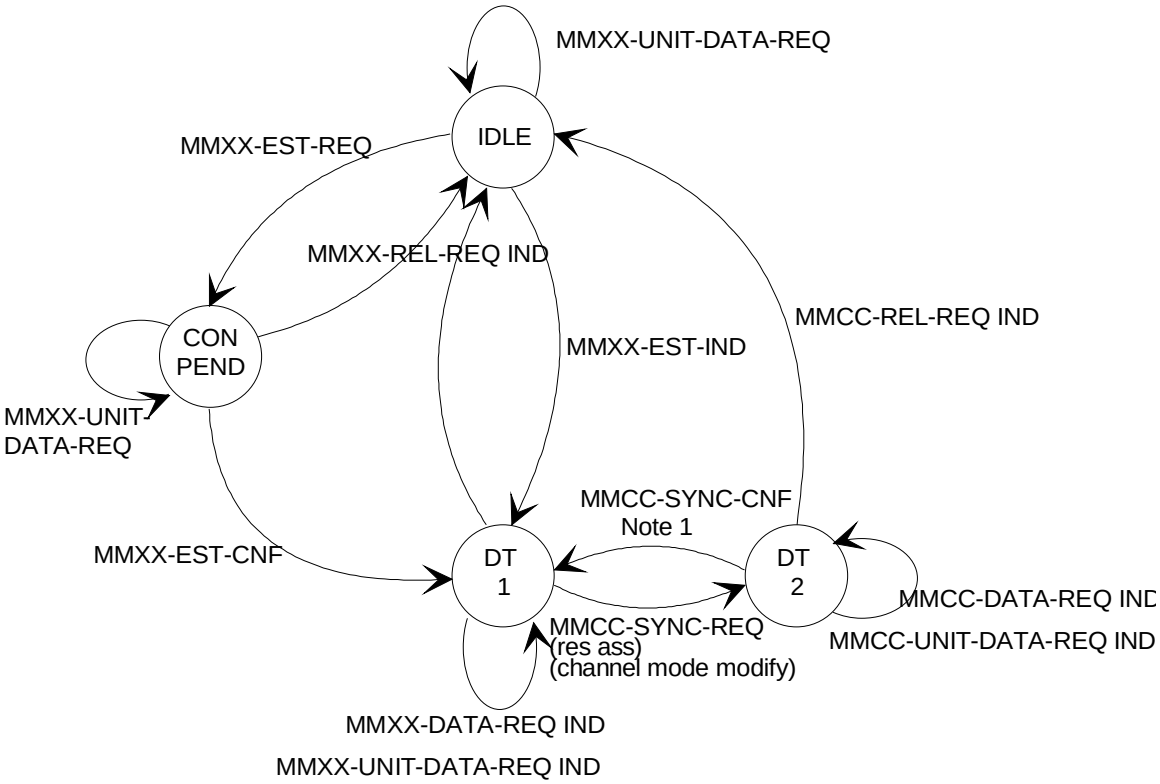
NOTE: The LCS protocol entities for communication between a type A LMU and the network would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

Figure 10.3: Services provided at MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - Network side

~~NOTE: Figure 10.3 shall be updated to include the new LCS PD in the same manner as for the other PDs.~~

10.2.1 Service state diagram

The primitives provided by the Mobility Management entity towards Call Control, Short Messages Service Support, Location Services Support (for a type A LMU) and call independent Supplementary Services Support ~~(for type A LMU)~~ as well as the transition between permitted states are illustrated in figure 10.4.



NOTE 1: the parameters in RR_SYNC_CNF must correspond to the parameter in RR_SYNC_REQ.
NOTE 2: MMCC-primitives only at MMCC-SAP.
NOTE 3: The prefix MMXX is used for substitution of MMCC, MMSS, MMLCS (for type A LMU) or MMSMS.

Figure 10.4: Service graph of the Mobility Management entity, towards Call Control - Network side

10.2.2 Service primitives

Table 10.2: Primitives and Parameters at MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - Network side

PRIMITIVES	PARAMETERS	REFERENCE
MMXX_EST_REQ (see note 1)	Mobile ID	10.2.2.1
MMXX_EST_IND (see note 1)	First CM message	10.2.2.2
MMXX_EST_CNF (see note 1)	-	10.2.2.3
MMXX_REL_REQ (see note 1)	cause	10.2.2.4
MMXX_REL_IND (see note 1)	cause	10.2.2.5
MMXX_DATA_REQ (see note 1)	Layer 3 message	10.2.2.6
MMXX_DATA_IND (see note 1)	Layer 3 message	10.2.2.7
MMXX_UNIT_DATA_REQ (see note 1)	Layer 3 message	10.2.2.8
MMXX_UNIT_DATA_IND (see note 1)	Layer 3 message	10.2.2.9
MMCC_SYNC_REQ (see note 2)	cause (resource assign), list of (RAB ID, NAS Synchronization Indicator)	10.2.2.10
MMCC_SYNC_CNF (see note 2)	cause (resource assign)	10.2.2.11
NOTE 1: MMXX is used as substitution for MMCC, MMSS, MMLCS (for type A LMU) or MMSMS. NOTE 2: Only at MMCC-SAP.		

10.2.2.1 MMXX_EST_REQ

Request by CC, SS, LCS (for type A LMU) and SMS respectively, for the establishment of a MM connection.

10.2.2.2 MMXX_EST_IND

Indication by the MM sublayer that a MM connection is established.

10.2.2.3 MMXX_EST_CNF

Confirmation of the MM connection establishment by the MM sublayer.

10.2.2.4 MMXX_REL_REQ

Request by CC, SS, LCS (for type A LMU) or SMS respectively, for the release of the MM connection.

10.2.2.5 MMXX_REL_IND

Indication by the MM sublayer that a MM connection has been released.

10.2.2.6 MMXX_DATA_REQ

Request by the CC, SS, LCS (for type A LMU) or SMS entities for acknowledged control-data transmission.

10.2.2.7 MMXX_DATA_IND

Indication used by MM to transfer the received acknowledged control-data to the CC, SS, LCS (for type A LMU) or SMS entities.

10.2.2.8 MMXX_UNIT_DATA_REQ

Request used by the CC, SS, LCS (for type A LMU) or SMS entities for unacknowledged control-data transmission.

10.2.2.9 MMXX_UNIT_DATA_IND

Indication used by MM to transfer the received unacknowledged control-data to the CC, SS, LCS (for type A LMU) or SMS entities.

10.2.2.10 MMCC_SYNC_REQ

Request used by the CC entity to synchronize with the MM entity (resource assign).

10.2.2.11 MMCC_SYNC_CNF

Confirmation used by the MM to inform the CC entity that synchronization is completed (resource assign).

In Iu mode, the CC entity includes the list of the RAB IDs and, optionally, the NAS Synchronization Indicators associated with the requested radio bearers.

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

11.2.3.1.1 Protocol discriminator

Bits 1 to 4 of the first octet of a standard L3 message contain the protocol discriminator (PD) information element. The PD identifies the L3 protocol to which the standard layer 3 message belongs. The correspondence between L3 protocols and PDs is one-to-one.

For future evolution an extension mechanism is foreseen which allows the use of protocol discriminators with one octet length, where bits 4 to one are coded as 1 1 1 0. Messages of such protocols may not be standard L3 messages. In particular, the rest of the header may not respect the structure described in this sub-clause.

The PD can take the following values:

Table 11.2: Protocol discriminator values

bits 4 3 2 1	
0 0 0 0	group call control
0 0 0 1	broadcast call control
0 0 1 0	Reserved: was allocated in earlier phases of the protocol
0 0 1 1	call control; call related SS messages
0 1 0 0	GPRS Transparent Transport Protocol (GTTP)
0 1 0 1	mobility management messages
0 1 1 0	radio resources management messages
1 0 0 0	GPRS mobility management messages
1 0 0 1	SMS messages
1 0 1 0	GPRS session management messages
1 0 1 1	non call related SS messages
1 1 0 0	Location services specified in 3GPP TS 04.71 [8a]
1 1 1 0	reserved for extension of the PD to one octet length
1 1 1 1	reserved for tests procedures described in ~~[5a]~~ 3GPP TS 04.14 [5a] and ~~[17a]~~ 3GPP TS 34.109 [17a].

If the network receives, on a SAP where it expects standard L3 messages, a message with a protocol discriminator different from those specified in table 11.2, the network may ignore the message or initiate the channel release procedure defined in 3GPP TS 04.18 [6b].

If the Mobile Station receives, on a SAP where it expects standard L3 messages, a standard L3 message with a protocol discriminator different from those specified in table 11.2, or for a protocol that it does not support, the Mobile Station shall ignore the message.

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

11.2.3.2.1 Message type octet (when accessing Release 98 and older networks only)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 98 or older network, the message type IE is coded as shown in figure 11.10a and 11.10x.

Bit 8 is encoded as "0"; value "1" is reserved for possible future use as an extension bit. A protocol entity expecting a standard L3 message, and receiving a message containing bit 8 of octet 2 encoded as "1" shall diagnose a " message not defined for the PD" error and treat the message accordingly.

In messages of MM, CC, SS, GCC, and BCC ~~and LCS~~ protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station or the LMU to the network, bit 7 of octet 2 is used for send sequence number, see subclause~~section~~ 11.2.3.2.3.

In messages of the LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the type A LMU to the network, bit 7 of octet 2 is used for send sequence number, see subclause 11.2.3.2.3.

In all other standard layer 3 messages, except for RR messages, bit 7 is set to a default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR layer, and receiving a message containing bit 7 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 7 is 0 except for the SM protocol where the default value is 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 04.18 [6b].

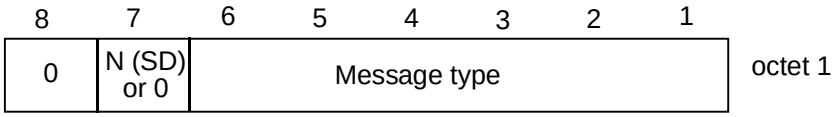


Figure 11.10a: Message type IE (MM, CC, SS, GCC, BCC and LCS)

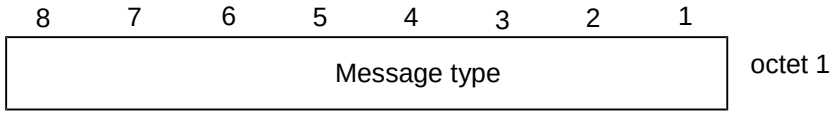


Figure 11.10x: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction and for a given lower layer SAP. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station) and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

11.2.3.2.2 Message type octet (when accessing Release 99 and newer networks)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 99 or later network, the message type IE is coded dependent on the PD as shown in figures 11.10b, c and d.

In messages of MM, CC and SS protocol sent using the transmission functionality provided by the RR and/or access stratum layer to upper layers, and sent from the mobile station or the LMU to the network, bits 7 and 8 of octet 2 are used for send sequence number, see section 11.2.3.2.3.

In messages of GCC~~,~~ and BCC ~~and LCS~~ protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station or~~to the network or, for LCS, sent from~~ the LMU to the network, only bit 7 of octet 2 is used for send sequence number. Bit 8 is set to the default value.

In messages of the LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the type A LMU to the network, only bit 7 of octet 2 is used for send sequence number. Bit 8 is set to the default value.

In all other standard layer 3 messages, except for RR messages, bits 7 and 8 are set to the default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR and/or access stratum layer, and receiving a message containing bit 7 or bit 8 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

In messages of the RR protocol entity, bit 8 of octet 2 is set to the default value. The other value is reserved for possible future use as an extension bit. If an RR protocol entity expecting a standard L3 message receives message containing bit 8 of octet 2 encoded different from the default value it shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 8 is 0. The default value for bit 7 is 0 except for the SM protocol which has a default value of 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 04.18 [6b].

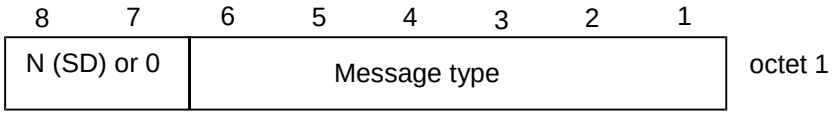


Figure 11.10b: Message type IE (MM, CC and SS)

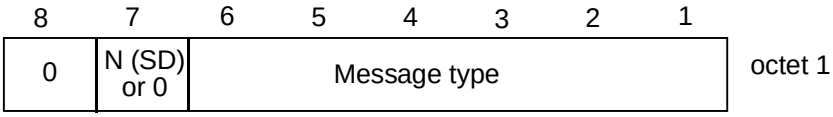


Figure 11.10c: Message type IE (GCC, BCC and LCS)

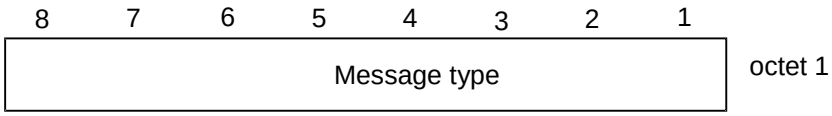


Figure 11.10d: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction and for a given lower layer SAP. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station) and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

3GPP TSG-CN1 Meeting #34
Zagreb, Croatia 10 – 14 May 2004

Tdoc N1-040965
(rev of Tdoc N1-040806)

CR-Form-v7

CHANGE REQUEST

⌘ **24.007** **CR** **061** ⌘ **rev** **1** ⌘ Current version: **4.2.0** ⌘

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

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

Title:	⌘	Corrections concerning the use of the LCS protocol
Source:	⌘	Siemens AG
Work item code:	⌘	LCS
Date:	⌘	27.04.2004
Category:	⌘	**A**
Release:	⌘	Rel-4

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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	With LS S2-041015 (N1-040527), SA2 asked for a clarification about the 'nature of location services' and the protocols involved in the signalling for location services. Closer inspection of TS 24.007 showed that the specification contains some inconsistencies with regard to the use of the LCS protocol entity and the protocol discriminators LCS and SS: In some places it needs to be clarified that the LCS entity is only present in a type A LMU (e.g. subclause 4.1 and 6.8), and that the protocol discriminator LCS is only used by these LMUs (e.g. clause 11). The reference to the supplementary service procedures to be used by the MS for location services is missing (clause 2, subclause 4.3.4). It is erroneously stated that an MS uses the LCS protocol when initiating positioning measurements (subclause 6.8). It is erroneously stated that the type A LMU uses the supplementary service protocol instead of the LCS protocol (subclause 10.2.1).
Summary of change:	⌘	Necessary clarifications are added and wrong statements corrected. The text of the notes under figures 5.1, 9.3, and 10.3 which required "(this) figure … shall be updated …" is changed, since apparently this update will not happen.
Consequences if not approved:	⌘	Inconsistent specification which may cause wrong implementations. If the MS uses PD = LCS instead of PD = SS when initiating a mobile originating location request, the request cannot be treated by the network.

Clauses affected:	⌘	2, 4.1, 4.3.4, 5.2, 6.8, 6.8.1, 6.8.2, 7, 7.6, 9.2, 10.2, 10.2.1, 10.2.2, 11.2.3.1.1, 11.2.3.2.1, 11.2.3.2.2			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	
			X Test specifications		
			X O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

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

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

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

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

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] GSM 01.02(R97): "Digital cellular telecommunications system (Phase 2+); General description of a GSM Public Land Mobile Network (PLMN)".

[1a] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.101: "General UMTS Architecture".

[3] 3GPP TS 44.001: "Mobile Station - Base Station System (MS - BSS) interface; General aspects and principles".

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

[3b] GSM 03.56(R98): "Digital cellular telecommunications system (Phase 2+); GSM Cordless Telephony System (CTS), Phase 1; CTS Architecture Description; Stage 2".

[3c] 3GPP TS 23.271: "Functional stage 2 description of location services".

[4] 3GPP TS 44.005: "Data Link (DL) layer; General aspects".

[5] 3GPP TS 44.006: "Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".

[5a] 3GPP TS 44.014: "Individual equipment type requirements and interworking; Special conformance testing functions".

[6] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification Core Network Protocols-Stage 3".

[6a] 3GPP TS 23.108: "Mobile radio interface Layer 3 specification Core Network Protocols Stage 2 (structured procedures)".

[6b] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[7] 3GPP TS 24.010: "Mobile radio interface Layer 3; Supplementary services specification; General aspects".

[8] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[8a] 3GPP TS 44.071: "Location Services (LCS); Mobile radio interface layer 3 LCS specification".

[9] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary services specification; Formats and coding".

[10] 3GPP TS 24.081: "Line identification supplementary services; Stage 3".

[10a] 3GPP TS 44.060: "General Packet Radio Services (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[10b] 3GPP TS 44.056: "GSM Cordless Telephony System (CTS), phase 1; CTS radio interface Layer 3 specification".

[11] 3GPP TS 24.082: "Call Forwarding (CF) supplementary services - Stage 3".

[11a] 3GPP TS 44.064: "General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification".

[12] 3GPP TS 24.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".

[12a] 3GPP TS 44.065: "General Packet Radio Service (GPRS); Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[13] 3GPP TS 24.084: "MultiParty (MPTY) supplementary services; Stage 3".

[14] 3GPP TS 24.085: "Closed User Group (CUG) supplementary services; Stage 3".

[15] 3GPP TS 24.086: "Advice of Charge (AoC) supplementary services; Stage 3".

[16] 3GPP TS 24.088: "Call Barring (CB) supplementary services; Stage 3".

[17] 3GPP TS 24.090: "Unstructured Supplementary Service Data (USSD) - Stage 3".

[17a] 3GPP TS 34.109: "Terminal logical test interface; Special conformance testing functions".

[18] ITU-T Recommendation X.200: "Information technology - Open Systems Interconnection - Basic Reference Model: The basic model".

[19] 3GPP TS 44.068: "Group Call Control (GCC) Protocol".

[20] 3GPP TS 23.110: "UMTS Access Stratum Services and Functions".

[21] 3GPP TS 24.030: "Location Services (LCS); Supplementary service operations – Stage 3".

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

4 Introduction

4.1 General

Three models are defined for Layer 3, one model for non-GPRS services, one for GPRS services supporting Class C MSs only and one model for GPRS-services supporting Class A and Class B MSs. (The third model is a combination of the first two models listed).

The layer 3 for non-GPRS services provides the functions necessary:

- for Radio Resource (RR) management;
- for Mobility Management (MM); and
- for the Connection Management (CM) functions, i.e. functions for the control, provision, and support of services offered by the network; among which there are, e.g.:
  - the functions to establish, maintain and terminate circuit-switched connections across a GSM PLMN and other networks to which the GSM PLMN is connected;
  - supporting functions for supplementary services control;
  - supporting functions for short messages service control;
  - supporting functions for location services control (only for a type A LMU).

The layer 3 for non-GPRS services is composed of three sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (MM) functions; and
- the Connection Management (CM) functions.

When CTS services are added to non-GPRS services, the following functions are added:

- CTS Radio Resource Management (CTS-RR) functions to RR; and
- CTS Mobility Management (CTS-MM) functions to MM.

The layer 3 for GPRS services is composed of four sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (GMM);
- for the Logical Link Control (LLC);
- the Connection Management (CM) functions.

The Connection Management (CM) sublayer is composed of functional blocks for:

- Call Control (CC) for non-GPRS services;
- Short Message Service Support (SMS) for non-GPRS services;
- GPRS Short Message Service Support (GSMS) (for GPRS services supporting Class A, B and C MSs);
- Session Management (SM) (for GPRS services supporting Class A, B and C MSs);
- Supplementary Services Support (SS) for non-GPRS services;
- Group Call Control for non-GPRS services;
- Broadcast Call Control (BCC) for non-GPRS services;
- Connection Management of Packet Data on Signalling channels for non-GPRS services;
- Location Services support (LCS) for non-GPRS services (only for a type A LMU).

Within the context of LCS, for GSM LCS, the services defined for an MS are equally applicable to a type A LMU, unless otherwise stated. However, services defined specifically for a type A LMU are not applicable to an MS. The following is a list of services essential for a type A LMU.

The layer 3 for non-GPRS services provides the functions necessary:

- for Radio Resource (RR) management;
- for Mobility Management (MM); and
- supporting functions for location service control.

The layer 3 for non-GPRS services is composed of three sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (MM) functions; and
- the Connection Management (CM) functions.

The Connection Management (CM) sublayer is composed of functional block for:

- location services support (LCS) for non-GPRS services.

The present document does not consider the distribution of signalling functions among the different network equipments. The signalling functions are described between two systems which represent the MS side and the network side of the radio interface of layer 3. Only the functions in the network for signalling communication with one MS is considered.

For GPRS services, in addition to the signalling functions also the user data transfer is included in the present document.

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

4.3.4 Contents of layer 3 related Technical Specifications

- The Radio Resource (RR) management protocol is defined in 3GPP TS 44.018 [6b];
- the Mobility Management (MM) protocol is defined in 3GPP TS 24.008 [6];
- the Session Management (SM) protocol is defined in 3GPP TS 24.008 [6];
- the Call Control (CC) protocol is defined in 3GPP TS 24.008 [6];
- the Supplementary Services (SS) protocol is defined in 3GPP TS 24.010 [7], 3GPP TS 24.08x, ~~and~~ 3GPP TS 24.09x, and 3GPP TS 24.030 [21];
- the Short Message Service (SMS) protocol is defined in 3GPP TS 24.011 [8];
- the Group Call Control (GCC) protocol is defined in 3GPP TS 44.068 [19];
- the Logical Link Control (LLC) protocol is defined in 3GPP TS 44.064 [11a];
- the GPRS Radio Resource (GRR) protocol is defined in 3GPP TS 44.060 [10a] and 3GPP TS 24.008 [6];
- the CTS Radio Resource (CTS-RR) sub-protocol is defined in 3GPP TS 44.056 [10b];
- the CTS Mobility Management (CTS-MM) sub-protocol is defined in 3GPP TS 44.056 [10b];
- the CTS additions to the Call Control (CC) protocol are defined in 3GPP TS 44.056 [10b];
- the Location Services (LCS) protocol for a type A LMU is defined in 3GPP TS 23.271 [3c] and 3GPP TS 44.071 [8a].

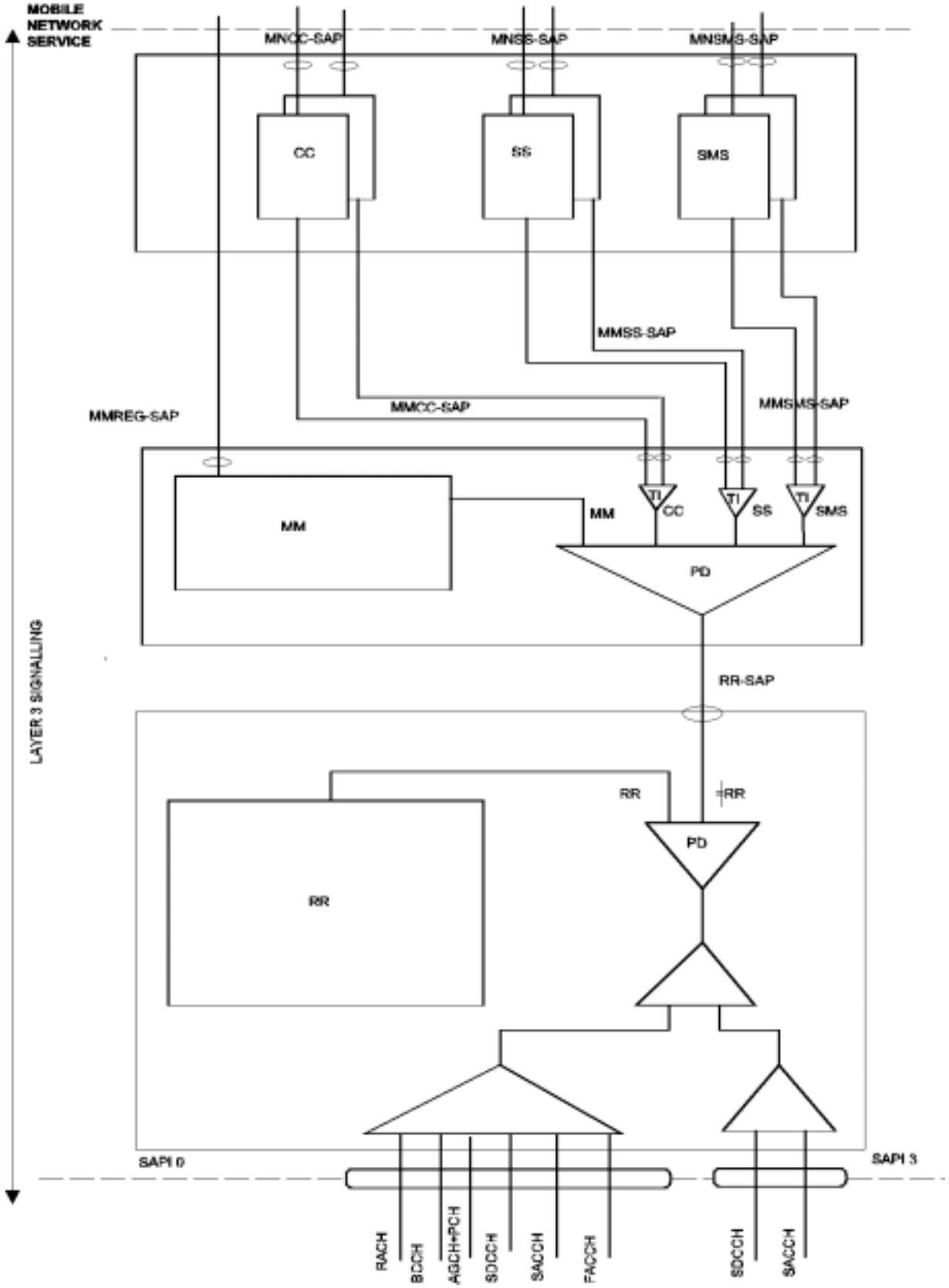
********** NEXT MODIFIED SECTION **********

5.2 Protocol architecture

The protocol architecture is visualized 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 three~~four~~ paradigmatic examples, CC, ~~LCS,~~ SS, and SMS. The LCS protocol entity of a type A LMU would be included in the same manner. 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.



NOTE: The LCS protocol entity for a type A LMU would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

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.~~

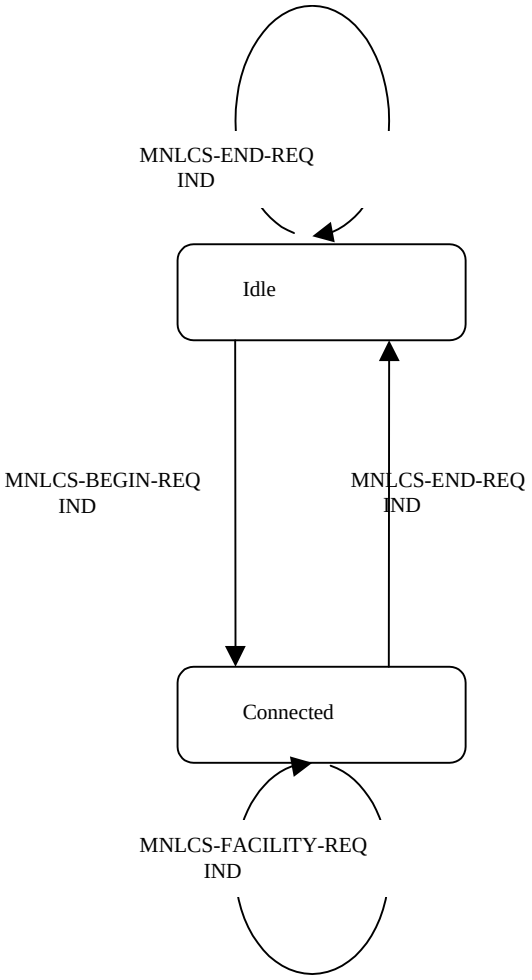
********** NEXT MODIFIED SECTION **********

6.8 Location services at the ~~MS~~ type A LMU side

The location services (~~initiation of positioning measurements at the MS~~e.g. transfer of timing related measurement information by a type A LMU) are provided at the service access point MNLCS-SAP. The service provided by the CM sublayer to support the location services is defined in 3GPP TS 44.071 [8a].

6.8.1 Service state diagram

The positioning services provided at the service access point MNLCS-SAP are illustrated in the state diagram of figure 6.8.



STATES:
IDLE - No LCS signalling transaction pending.
CONN - LCS signalling transaction established.

Figure 6.8: Service graph of the Location Services Support entity - ~~MS~~ type A LMU side

6.8.2 Service primitives

Table 6.8: Primitives and Parameters at MNLCS-SAP - ~~MS~~ type A LMU side

PRIMITIVES	PARAMETERS (Info elements of message)	REFERENCE
MNLCS_BEGIN_REQ	REGISTER	6.8.2.1
MNLCS_BEGIN_IND	REGISTER	6.8.2.2
MNLCS_FACILITY_REQ	FACILITY	6.8.2.3
MNLCS_FACILITY_IND	FACILITY	6.8.2.4
MNLCS_END_REQ	RELEASE COMPLETE	6.8.2.5
MNLCS_END_IND	RELEASE COMPLETE	6.8.2.6

6.8.2.1 MNLCS_BEGIN_REQ

Request to send a REGISTER message in order to establish a signalling transaction for the provision of location services. The request for transfer of a location service facility may be included.

6.8.2.2 MNLCS_BEGIN_IND

Receipt of a REGISTER message, a signalling transaction is established for the provision of location services after receipt of a REGISTER message. The indication of a location service facility may be included.

6.8.2.3 MNLCS_FACILITY_REQ

Request to send a FACILITY message for the provision of a location service invocation. The request for transfer of a location service facility may be included.

6.8.2.4 MNLCS_FACILITY_IND

Receipt of a FACILITY message, a location service facility has been requested.

6.8.2.5 MNLCS_END_REQ

Request to send a RELEASE COMPLETE message in order to release the signalling transaction. The request for transfer of a location service facility may be included.

6.8.2.6 MNLCS_END_IND

Receipt of a RELEASE COMPLETE message, the signalling transaction has been released. The indication of a location service facility may be included.

7 Services provided by signalling layer 3 on the Network side

In this clause, the services provided by signalling layer 3 on the network side are described which belong to the CM sub-layer functional blocks of CC, SMS, LCS, and SS. The services corresponding to further functional blocks of the CM sublayer are not further described in this clause.

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

7.6 Location services at the Network side

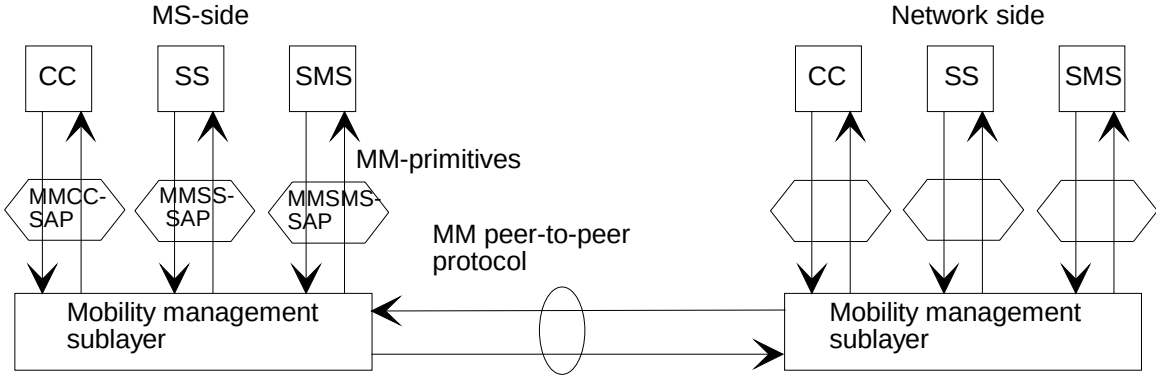
The location services (e.g. network initiation of timing related~~location~~ measurements in a type A LMU~~at the network~~) are provided at the service access point MNLCS-SAP. The service provided by the CM sublayer to support the location services is defined in 3GPP TS 44.071 [8a] (for communication with a type A LMU only).

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

9.2 Services provided by the Mobility Management entity

The Mobility Management (MM) sublayer provides services to the Call Control (CC) entity, the Supplementary Services Support (SS) entity, the Location Services (LCS) entity (only for type A LMU) and the Short Message Service Support (SMS) entity.

The Mobility Management services primitives are discriminated by the MMCC, MMSS, MMLCS and MMSMS prefix.



NOTE: The LCS protocol entities for communication between a type A LMU and the network would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

Figure 9.3: Services provided at the MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - MS side

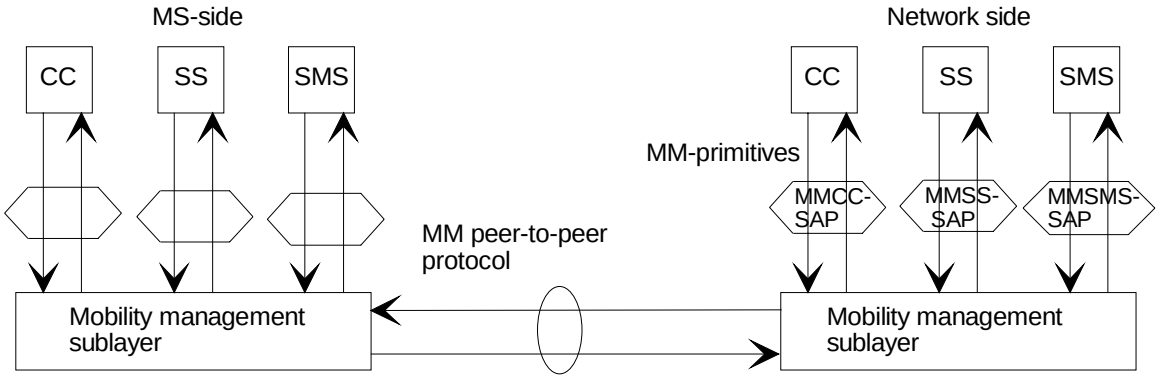
~~NOTE: Figure 9.3 shall be updated to include the LCS PD in the same manner as the other PDs are shown.~~

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

10.2 Services provided by the Mobility Management entity

The Mobility Management (MM) sublayer provides services to the Call Control (CC) entity, the Supplementary Service Support (SS) entity, the Location Services (LCS) (for type A LMU) and the Short Message Service Support (SMS) entity.

The Mobility Management services primitives are recognized by the MMCC, MMSS, MMLCS and MMSMS prefix.



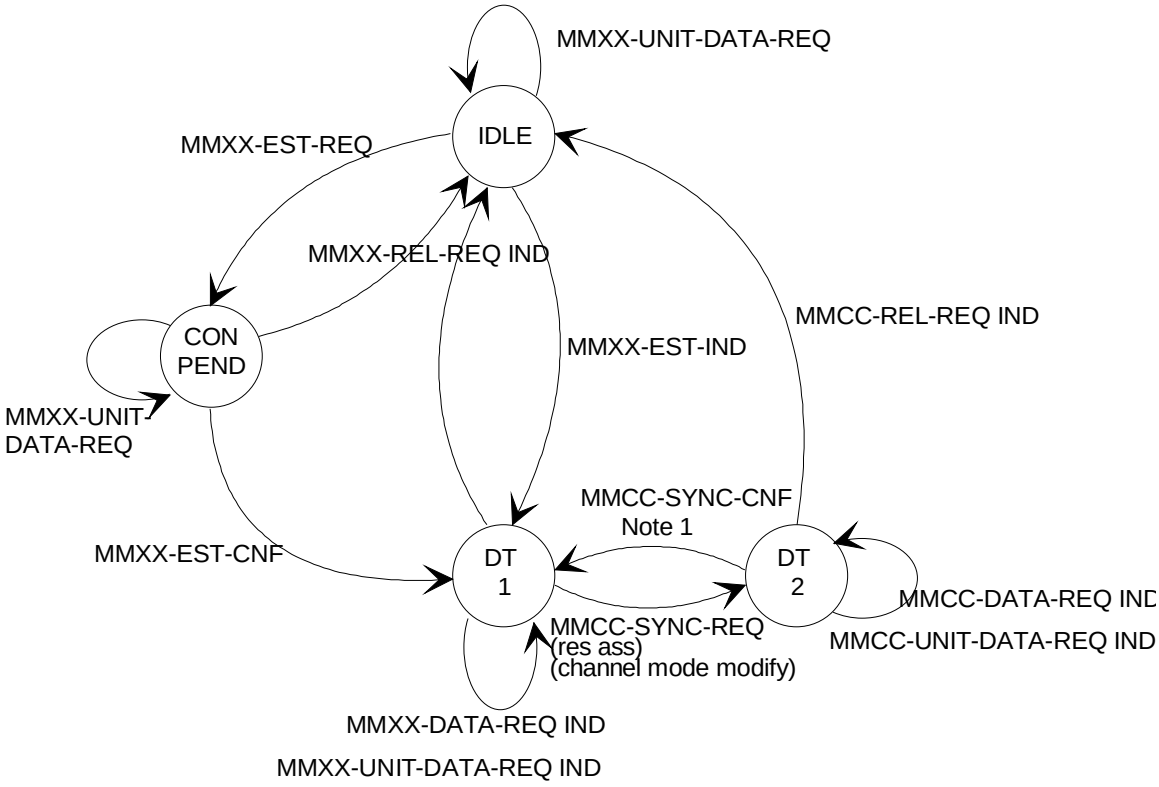
NOTE: The LCS protocol entities for communication between a type A LMU and the network would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

Figure 10.3: Services provided at MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - Network side

~~NOTE: Figure 10.3 shall be updated to include the new LCS PD in the same manner as for the other PDs.~~

10.2.1 Service state diagram

The primitives provided by the Mobility Management entity towards Call Control, Short Messages Service Support, Location Services Support (for a type A LMU) and call independent Supplementary Services Support ~~(for type A LMU)~~ as well as the transition between permitted states are illustrated in figure 10.4.



NOTE 1: the parameters in RR_SYNC_CNF must correspond to the parameter in RR_SYNC_REQ.
NOTE 2: MMCC-primitives only at MMCC-SAP.
NOTE 3: The prefix MMXX is used for substitution of MMCC, MMSS, MMLCS (for type A LMU) or MMSMS.

Figure 10.4: Service graph of the Mobility Management entity, towards Call Control - Network side

10.2.2 Service primitives

Table 10.2: Primitives and Parameters at MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - Network side

PRIMITIVES	PARAMETERS	REFERENCE
MMXX_EST_REQ (see note 1)	Mobile ID	10.2.2.1
MMXX_EST_IND (see note 1)	First CM message	10.2.2.2
MMXX_EST_CNF (see note 1)	-	10.2.2.3
MMXX_REL_REQ (see note 1)	cause	10.2.2.4
MMXX_REL_IND (see note 1)	cause	10.2.2.5
MMXX_DATA_REQ (see note 1)	Layer 3 message	10.2.2.6
MMXX_DATA_IND (see note 1)	Layer 3 message	10.2.2.7
MMXX_UNIT_DATA_REQ (see note 1)	Layer 3 message	10.2.2.8
MMXX_UNIT_DATA_IND (see note 1)	Layer 3 message	10.2.2.9
MMCC_SYNC_REQ (see note 2)	cause (resource assign), list of (RAB ID, NAS Synchronization Indicator)	10.2.2.10
MMCC_SYNC_CNF (see note 2)	cause (resource assign)	10.2.2.11
NOTE 1: MMXX is used as substitution for MMCC, MMSS, MMLCS (for type A LMU) or MMSMS. NOTE 2: Only at MMCC-SAP.		

10.2.2.1 MMXX_EST_REQ

Request by CC, SS, LCS (for type A LMU) and SMS respectively, for the establishment of a MM connection.

10.2.2.2 MMXX_EST_IND

Indication by the MM sublayer that a MM connection is established.

10.2.2.3 MMXX_EST_CNF

Confirmation of the MM connection establishment by the MM sublayer.

10.2.2.4 MMXX_REL_REQ

Request by CC, SS, LCS (for type A LMU) or SMS respectively, for the release of the MM connection.

10.2.2.5 MMXX_REL_IND

Indication by the MM sublayer that a MM connection has been released.

10.2.2.6 MMXX_DATA_REQ

Request by the CC, SS, LCS (for type A LMU) or SMS entities for acknowledged control-data transmission.

10.2.2.7 MMXX_DATA_IND

Indication used by MM to transfer the received acknowledged control-data to the CC, SS, LCS (for type A LMU) or SMS entities.

10.2.2.8 MMXX_UNIT_DATA_REQ

Request used by the CC, SS, LCS (for type A LMU) or SMS entities for unacknowledged control-data transmission.

10.2.2.9 MMXX_UNIT_DATA_IND

Indication used by MM to transfer the received unacknowledged control-data to the CC, SS, LCS (for type A LMU) or SMS entities.

10.2.2.10 MMCC_SYNC_REQ

Request used by the CC entity to synchronize with the MM entity (resource assign).

10.2.2.11 MMCC_SYNC_CNF

Confirmation used by the MM to inform the CC entity that synchronization is completed (resource assign).

In Iu mode, the CC entity includes the list of the RAB IDs and, optionally, the NAS Synchronization Indicators associated with the requested radio bearers.

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

11.2.3.1.1 Protocol discriminator

Bits 1 to 4 of the first octet of a standard L3 message contain the protocol discriminator (PD) information element. The PD identifies the L3 protocol to which the standard layer 3 message belongs. The correspondence between L3 protocols and PDs is one-to-one.

For future evolution an extension mechanism is foreseen which allows the use of protocol discriminators with one octet length, where bits 4 to one are coded as 1 1 1 0. Messages of such protocols may not be standard L3 messages. In particular, the rest of the header may not respect the structure described in this sub-clause.

The PD can take the following values:

Table 11.2: Protocol discriminator values

bits 4 3 2 1	
0 0 0 0	group call control
0 0 0 1	broadcast call control
0 0 1 0	Reserved: was allocated in earlier phases of the protocol
0 0 1 1	call control; call related SS messages
0 1 0 0	GPRS Transparent Transport Protocol (GTTP)
0 1 0 1	mobility management messages
0 1 1 0	radio resources management messages
1 0 0 0	GPRS mobility management messages
1 0 0 1	SMS messages
1 0 1 0	GPRS session management messages
1 0 1 1	non call related SS messages
1 1 0 0	Location services specified in 3GPP TS 44.071 [8a]
1 1 1 0	reserved for extension of the PD to one octet length
1 1 1 1	reserved for tests procedures described in ~~[5a]~~ 3GPP TS 44.014 [5a] and ~~[17a]~~ 3GPP TS 34.109 [17a].

If the network receives, on a SAP where it expects standard L3 messages, a message with a protocol discriminator different from those specified in table 11.2, the network may ignore the message or initiate the channel release procedure defined in 3GPP TS 44.018 [6b].

If the Mobile Station receives, on a SAP where it expects standard L3 messages, a standard L3 message with a protocol discriminator different from those specified in table 11.2, or for a protocol that it does not support, the Mobile Station shall ignore the message.

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

11.2.3.2 Message type octet

11.2.3.2.1 Message type octet (when accessing Release 98 and older networks only)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 98 or older network, the message type IE is coded as shown in figure 11.10a and 11.10x.

Bit 8 is encoded as "0"; value "1" is reserved for possible future use as an extension bit. A protocol entity expecting a standard L3 message, and receiving a message containing bit 8 of octet 2 encoded as "1" shall diagnose a " message not defined for the PD" error and treat the message accordingly.

In messages of MM, CC, SS, GCC, and BCC ~~and LCS~~ protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station or the LMU to the network, bit 7 of octet 2 is used for send sequence number, see subclause 11.2.3.2.3.

In messages of the LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the type A LMU to the network, bit 7 of octet 2 is used for send sequence number, see subclause 11.2.3.2.3.

In all other standard layer 3 messages, except for RR messages, bit 7 is set to a default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR layer, and receiving a message containing bit 7 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 7 is 0 except for the SM protocol where the default value is 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 44.018.

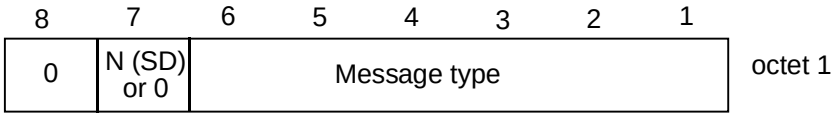


Figure 11.10a: Message type IE (MM, CC, SS, GCC, BCC and LCS)

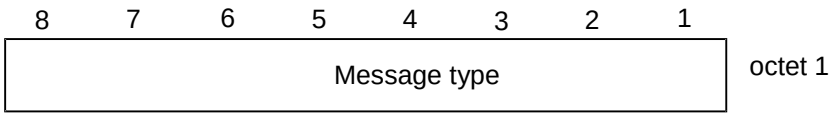


Figure 11.10x: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction and for a given lower layer SAP. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station) and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

11.2.3.2.2 Message type octet (when accessing Release 99 and newer networks)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 99 or later network, the message type IE is coded dependent on the PD as shown in figures 11.10b, c and d.

In messages of MM, CC and SS protocol sent using the transmission functionality provided by the RR and/or access stratum layer to upper layers, and sent from the mobile station or the LMU to the network, bits 7 and 8 of octet 2 are used for send sequence number, see clause 11.2.3.2.3.

In messages of GCC, and BCC and LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station or to the network or, for LCS, sent from the LMU to the network, only bit 7 of octet 2 is used for send sequence number. Bit 8 is set to the default value.

In messages of the LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the type A LMU to the network, only bit 7 of octet 2 is used for send sequence number. Bit 8 is set to the default value.

In all other standard layer 3 messages, except for RR messages, bits 7 and 8 are set to the default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR and/or access stratum layer, and receiving a message containing bit 7 or bit 8 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

In messages of the RR protocol entity, bit 8 of octet 2 is set to the default value. The other value is reserved for possible future use as an extension bit .If an RR protocol entity expecting a standard L3 message receives message containing bit 8 of octet 2 encoded different from the default value it shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 8 is 0. The default value for bit 7 is 0 except for the SM protocol which has a default value of 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 44.018.

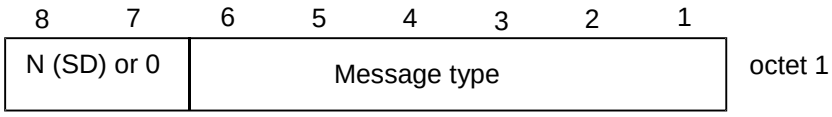


Figure 11.10b: Message type IE (MM, CC and SS)

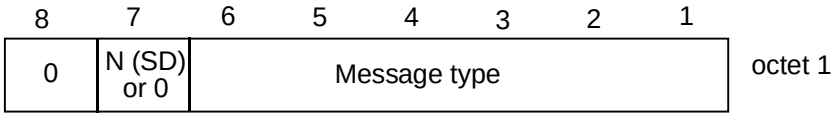


Figure 11.10c: Message type IE (GCC, BCC and LCS)

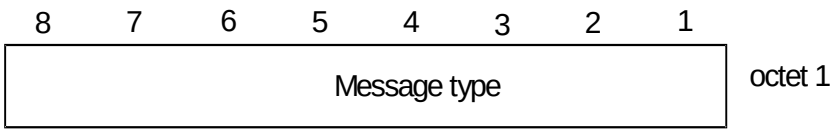


Figure 11.10d: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction and for a given lower layer SAP. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station) and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

3GPP TSG-CN1 Meeting #34
Zagreb, Croatia 10 – 14 May 2004

Tdoc N1-040966
(rev of Tdoc N1-040807)

CR-Form-v7

CHANGE REQUEST

⌘ **24.007** **CR** **062** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

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

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

Title:	⌘	Corrections concerning the use of the LCS protocol
Source:	⌘	Siemens AG
Work item code:	⌘	LCS ***Date:*** ⌘ 27.04.2004
Category:	⌘	**A** ***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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	With LS S2-041015 (N1-040527), SA2 asked for a clarification about the 'nature of location services' and the protocols involved in the signalling for location services. Closer inspection of TS 24.007 showed that the specification contains some inconsistencies with regard to the use of the LCS protocol entity and the protocol discriminators LCS and SS: In some places it needs to be clarified that the LCS entity is only present in a type A LMU (e.g. subclause 4.1 and 6.8), and that the protocol discriminator LCS is only used by these LMUs (e.g. clause 11). The reference to the supplementary service procedures to be used by the MS for location services is missing (clause 2, subclause 4.3.4). It is erroneously stated that an MS uses the LCS protocol when initiating positioning measurements (subclause 6.8). It is erroneously stated that the type A LMU uses the supplementary service protocol instead of the LCS protocol (subclause 10.2.1).
Summary of change:	⌘	Necessary clarifications are added and wrong statements corrected. The text of the notes under figures 5.1, 9.3, and 10.3 which required "(this) figure … shall be updated …" is changed, since apparently this update will not happen.
Consequences if not approved:	⌘	Inconsistent specification which may cause wrong implementations. If the MS uses PD = LCS instead of PD = SS when initiating a mobile originating location request, the request cannot be treated by the network.

Clauses affected:	⌘	2, 4.1, 4.3.4, 5.2, 6.8, 6.8.1, 6.8.2, 7, 7.6, 9.2, 10.2, 10.2.1, 10.2.2, 11.2.3.1.1, 11.2.3.2.1, 11.2.3.2.2			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	
			X Test specifications		
			X O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

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

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

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

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

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] GSM 01.02(R97): "Digital cellular telecommunications system (Phase 2+); General description of a GSM Public Land Mobile Network (PLMN)".

[1a] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.101: "General UMTS Architecture".

[3] 3GPP TS 44.001: "Mobile Station - Base Station System (MS - BSS) interface; General aspects and principles".

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

[3b] GSM 03.56(R98): "Digital cellular telecommunications system (Phase 2+); GSM Cordless Telephony System (CTS), Phase 1; CTS Architecture Description; Stage 2".

[3c] 3GPP TS 23.271: "Functional stage 2 description of location services".

[4] 3GPP TS 44.005: "Data Link (DL) layer; General aspects".

[5] 3GPP TS 44.006: "Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".

[5a] 3GPP TS 44.014: "Individual equipment type requirements and interworking; Special conformance testing functions".

[6] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification Core Network Protocols-Stage 3".

[6a] 3GPP TS 23.108: "Mobile radio interface Layer 3 specification Core Network Protocols Stage 2 (structured procedures)".

[6b] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[7] 3GPP TS 24.010: "Mobile radio interface Layer 3; Supplementary services specification; General aspects".

[8] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[8a] 3GPP TS 44.071: "Location Services (LCS); Mobile radio interface layer 3 LCS specification".

[9] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary services specification; Formats and coding".

[10] 3GPP TS 24.081: "Line identification supplementary services; Stage 3".

[10a] 3GPP TS 44.060: "General Packet Radio Services (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[10b] 3GPP TS 44.056: "GSM Cordless Telephony System (CTS), phase 1; CTS radio interface Layer 3 specification".

[11] 3GPP TS 24.082: "Call Forwarding (CF) supplementary services - Stage 3".

[11a] 3GPP TS 44.064: "General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification".

[12] 3GPP TS 24.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".

[12a] 3GPP TS 44.065: "General Packet Radio Service (GPRS); Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[13] 3GPP TS 24.084: "MultiParty (MPTY) supplementary services; Stage 3".

[14] 3GPP TS 24.085: "Closed User Group (CUG) supplementary services; Stage 3".

[15] 3GPP TS 24.086: "Advice of Charge (AoC) supplementary services; Stage 3".

[16] 3GPP TS 24.088: "Call Barring (CB) supplementary services; Stage 3".

[17] 3GPP TS 24.090: "Unstructured Supplementary Service Data (USSD) - Stage 3".

[17a] 3GPP TS 34.109: "Terminal logical test interface; Special conformance testing functions".

[18] ITU-T Recommendation X.200: "Information technology - Open Systems Interconnection - Basic Reference Model: The basic model".

[19] 3GPP TS 44.068: "Group Call Control (GCC) Protocol".

[20] 3GPP TS 23.110: "UMTS Access Stratum Services and Functions".

[21] 3GPP TS 24.030: "Location Services (LCS); Supplementary service operations – Stage 3".

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

4 Introduction

4.1 General

Three models are defined for Layer 3, one model for non-GPRS services, one for GPRS services supporting Class C MSs only and one model for GPRS-services supporting Class A and Class B MSs. (The third model is a combination of the first two models listed).

The layer 3 for non-GPRS services provides the functions necessary:

- for Radio Resource (RR) management;
- for Mobility Management (MM); and
- for the Connection Management (CM) functions, i.e. functions for the control, provision, and support of services offered by the network; among which there are, e.g.:
  - the functions to establish, maintain and terminate circuit-switched connections across a GSM PLMN and other networks to which the GSM PLMN is connected;
  - supporting functions for supplementary services control;
  - supporting functions for short messages service control;
  - supporting functions for location services control (only for a type A LMU).

The layer 3 for non-GPRS services is composed of three sublayers comprising:

- the Radio Resource Management (RR) functions;

- the Mobility Management (MM) functions; and
- the Connection Management (CM) functions.

When CTS services are added to non-GPRS services, the following functions are added:

- CTS Radio Resource Management (CTS-RR) functions to RR; and
- CTS Mobility Management (CTS-MM) functions to MM.

The layer 3 for GPRS services is composed of four sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (GMM);
- for the Logical Link Control (LLC);
- the Connection Management (CM) functions.

The Connection Management (CM) sublayer is composed of functional blocks for:

- Call Control (CC) for non-GPRS services;
- Short Message Service Support (SMS) for non-GPRS services;
- GPRS Short Message Service Support (GSMS) (for GPRS services supporting Class A, B and C MSs);
- Session Management (SM) (for GPRS services supporting Class A, B and C MSs);
- Supplementary Services Support (SS) for non-GPRS services;
- Group Call Control for non-GPRS services;
- Broadcast Call Control (BCC) for non-GPRS services;
- Connection Management of Packet Data on Signalling channels for non-GPRS services;
- Location Services support (LCS) for non-GPRS services (only for a type A LMU).

Within the context of LCS, for GSM LCS, the services defined for an MS are equally applicable to a type A LMU, unless otherwise stated. However, services defined specifically for a type A LMU are not applicable to an MS. The following is a list of services essential for a type A LMU.

The layer 3 for non-GPRS services provides the functions necessary:

- for Radio Resource (RR) management;
- for Mobility Management (MM); and
- supporting functions for location service control.

The layer 3 for non-GPRS services is composed of three sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (MM) functions; and
- the Connection Management (CM) functions.

The Connection Management (CM) sublayer is composed of functional block for:

- location services support (LCS) for non-GPRS services.

The present document does not consider the distribution of signalling functions among the different network equipments. The signalling functions are described between two systems which represent the MS side and the network side of the radio interface of layer 3. Only the functions in the network for signalling communication with one MS is considered.

For GPRS services, in addition to the signalling functions also the user data transfer is included in the present document.

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

4.3.4 Contents of layer 3 related Technical Specifications

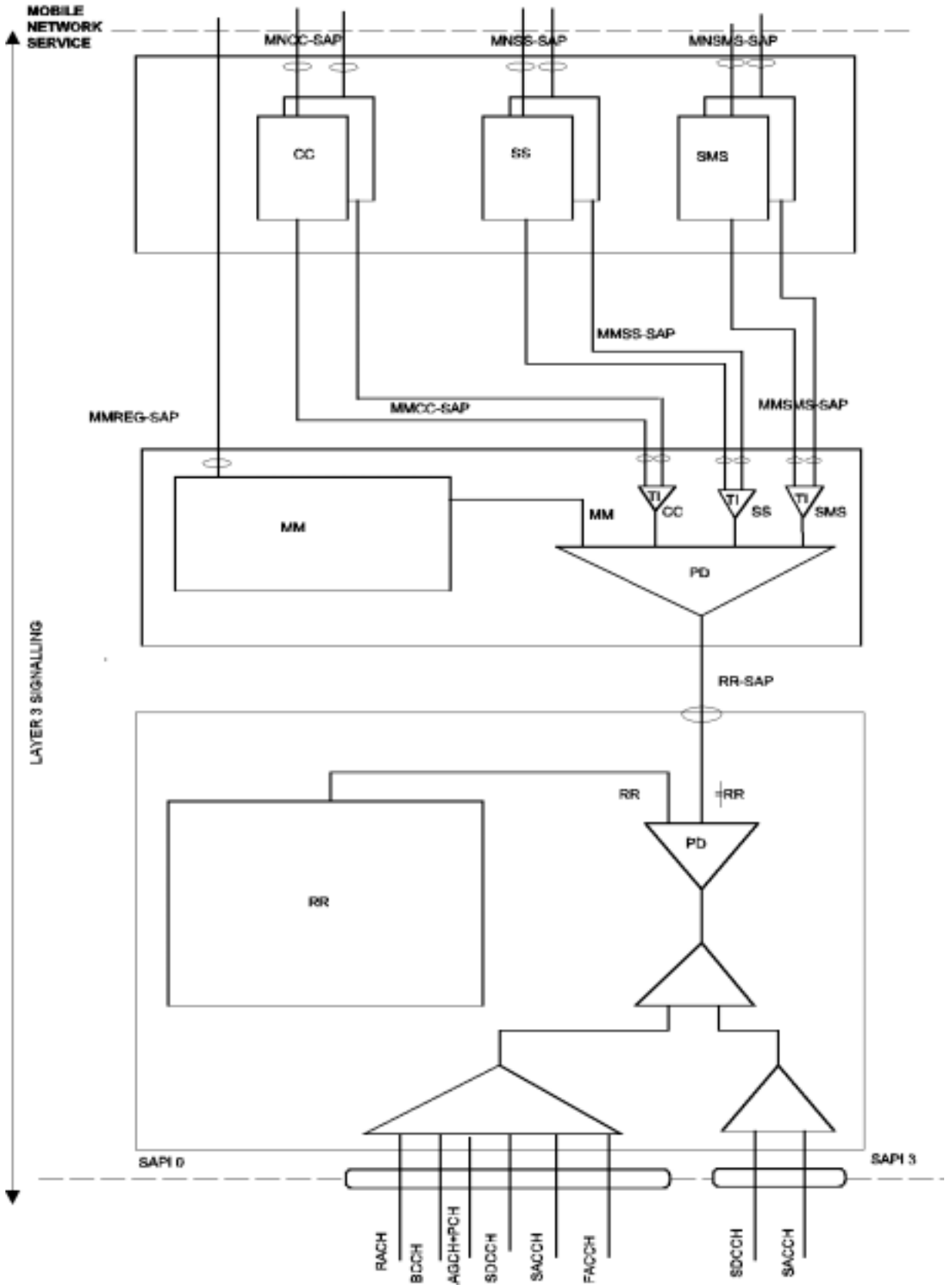
- The Radio Resource (RR) management protocol is defined in 3GPP TS 44.018 [6b];
- the Mobility Management (MM) protocol is defined in 3GPP TS 24.008 [6];
- the Session Management (SM) protocol is defined in 3GPP TS 24.008 [6];
- the Call Control (CC) protocol is defined in 3GPP TS 24.008 [6];
- the Supplementary Services (SS) protocol is defined in 3GPP TS 24.010 [7], 3GPP TS 24.08x, ~~and~~ 3GPP TS 24.09x, and 3GPP TS 24.030 [21];
- the Short Message Service (SMS) protocol is defined in 3GPP TS 24.011 [8];
- the Group Call Control (GCC) protocol is defined in 3GPP TS 44.068 [19];
- the Logical Link Control (LLC) protocol is defined in 3GPP TS 44.064 [11a];
- the GPRS Radio Resource (GRR) protocol is defined in 3GPP TS 44.060 [10a] and 3GPP TS 24.008 [6];
- the CTS Radio Resource (CTS-RR) sub-protocol is defined in 3GPP TS 44.056 [10b];
- the CTS Mobility Management (CTS-MM) sub-protocol is defined in 3GPP TS 44.056 [10b];
- the CTS additions to the Call Control (CC) protocol are defined in 3GPP TS 44.056 [10b];
- the Location Services (LCS) protocol for a type A LMU is defined in 3GPP TS 23.271 [3c] and 3GPP TS 44.071 [8a].

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

5.2 Protocol architecture

The protocol architecture is visualized 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~~ three paradigmatic examples, CC, ~~LCS,~~ SS, and SMS. The LCS protocol entity of a type A LMU would be included in the same manner. 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.



NOTE: The LCS protocol entity for a type A LMU would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

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.~~

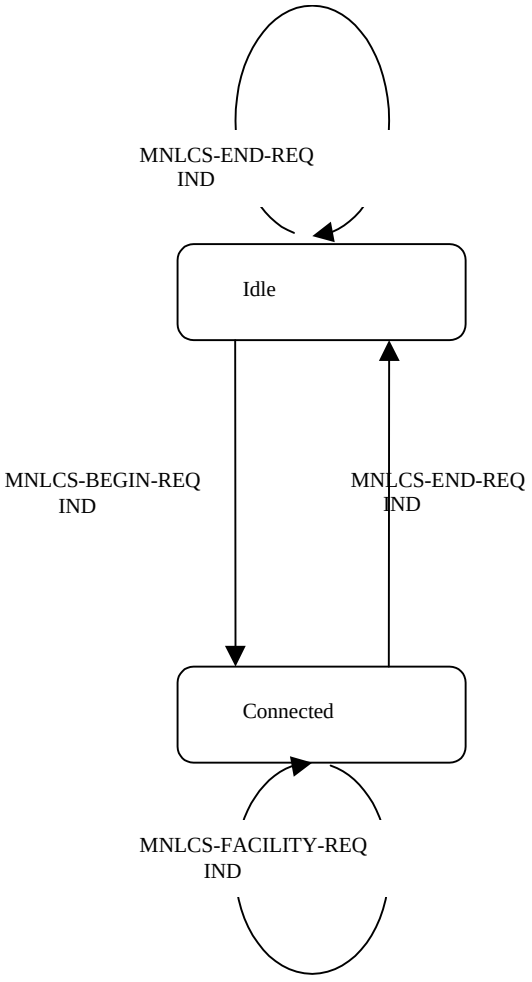
********** NEXT MODIFIED SECTION **********

6.8 Location services at the ~~MS~~ type A LMU side

The location services (~~initiation of positioning measurements at the MS~~e.g. transfer of timing related measurement information by a type A LMU) are provided at the service access point MNLCS-SAP. The service provided by the CM sublayer to support the location services is defined in 3GPP TS 44.071 [8a].

6.8.1 Service state diagram

The positioning services provided at the service access point MNLCS-SAP are illustrated in the state diagram of figure 6.8.



STATES:
IDLE - No LCS signalling transaction pending.
CONN - LCS signalling transaction established.

Figure 6.8: Service graph of the Location Services Support entity - ~~MS~~ type A LMU side

6.8.2 Service primitives

Table 6.8: Primitives and Parameters at MNLCS-SAP - ~~MS~~ type A LMU side

PRIMITIVES	PARAMETERS (Info elements of message)	REFERENCE
MNLCS_BEGIN_REQ	REGISTER	6.8.2.1
MNLCS_BEGIN_IND	REGISTER	6.8.2.2
MNLCS_FACILITY_REQ	FACILITY	6.8.2.3
MNLCS_FACILITY_IND	FACILITY	6.8.2.4
MNLCS_END_REQ	RELEASE COMPLETE	6.8.2.5
MNLCS_END_IND	RELEASE COMPLETE	6.8.2.6

6.8.2.1 MNLCS_BEGIN_REQ

Request to send a REGISTER message in order to establish a signalling transaction for the provision of location services. The request for transfer of a location service facility may be included.

6.8.2.2 MNLCS_BEGIN_IND

Receipt of a REGISTER message, a signalling transaction is established for the provision of location services after receipt of a REGISTER message. The indication of a location service facility may be included.

6.8.2.3 MNLCS_FACILITY_REQ

Request to send a FACILITY message for the provision of a location service invocation. The request for transfer of a location service facility may be included.

6.8.2.4 MNLCS_FACILITY_IND

Receipt of a FACILITY message, a location service facility has been requested.

6.8.2.5 MNLCS_END_REQ

Request to send a RELEASE COMPLETE message in order to release the signalling transaction. The request for transfer of a location service facility may be included.

6.8.2.6 MNLCS_END_IND

Receipt of a RELEASE COMPLETE message, the signalling transaction has been released. The indication of a location service facility may be included.

7 Services provided by signalling layer 3 on the Network side

In this clause, the services provided by signalling layer 3 on the network side are described which belong to the CM sub-layer functional blocks of CC, SMS, LCS, and SS. The services corresponding to further functional blocks of the CM sublayer are not further described in this clause.

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

7.6 Location services at the Network side

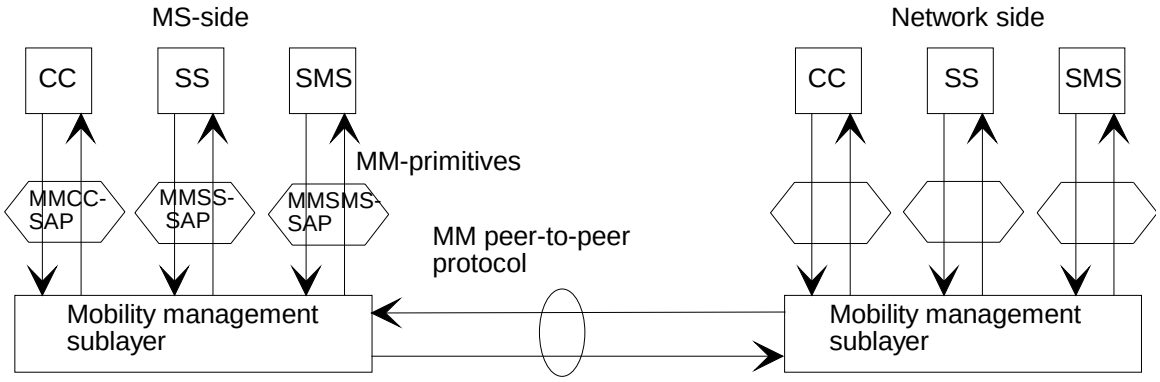
The location services (e.g. network initiation of timing related ~~location~~ measurements in a type A LMU~~at the network~~) are provided at the service access point MNLCS-SAP. The service provided by the CM sublayer to support the location services is defined in 3GPP TS 44.071 [8a] (for communication with a type A LMU only).

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

9.2 Services provided by the Mobility Management entity

The Mobility Management (MM) sublayer provides services to the Call Control (CC) entity, the Supplementary Services Support (SS) entity, the Location Services (LCS) entity (only for type A LMU) and the Short Message Service Support (SMS) entity.

The Mobility Management services primitives are discriminated by the MMCC, MMSS, MMLCS and MMSMS prefix.



NOTE: The LCS protocol entities for communication between a type A LMU and the network would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

Figure 9.3: Services provided at the MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - MS side

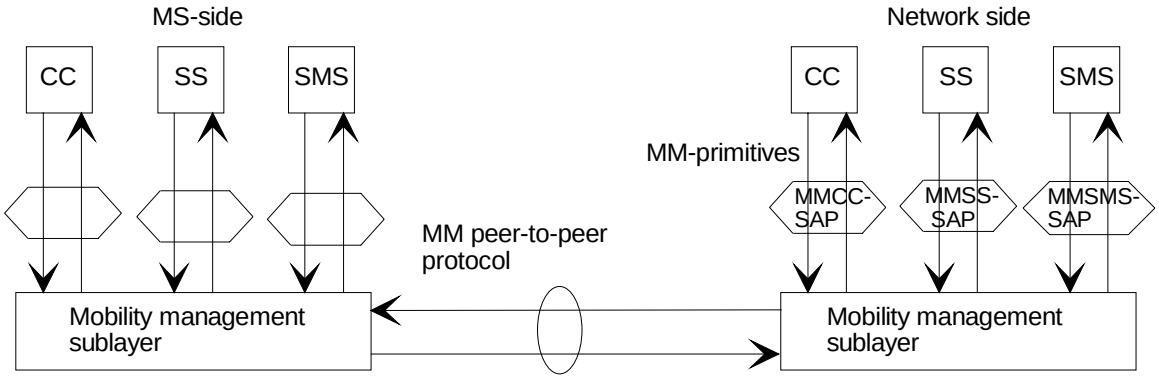
~~NOTE: Figure 9.3 shall be updated to include the LCS PD in the same manner as the other PDs are shown.~~

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

10.2 Services provided by the Mobility Management entity

The Mobility Management (MM) sublayer provides services to the Call Control (CC) entity, the Supplementary Service Support (SS) entity, the Location Services (LCS) (for type A LMU) and the Short Message Service Support (SMS) entity.

The Mobility Management services primitives are recognized by the MMCC, MMSS, MMLCS and MMSMS prefix.



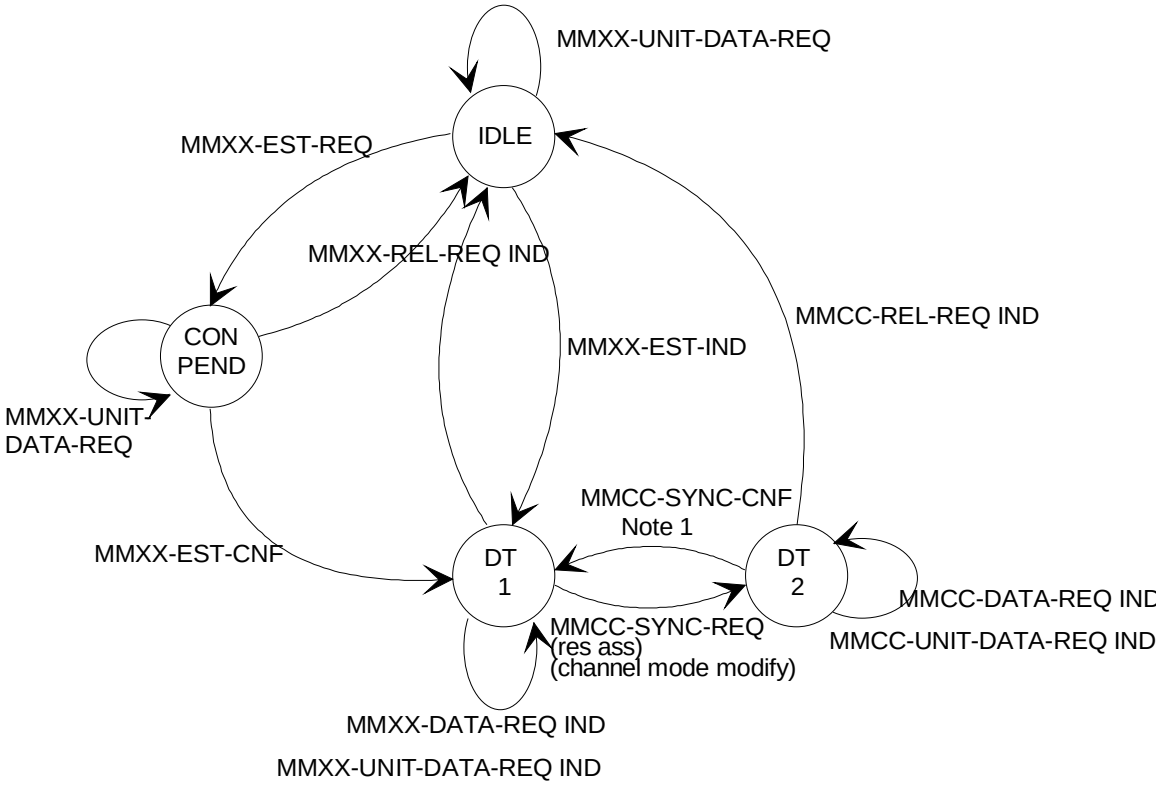
NOTE: The LCS protocol entities for communication between a type A LMU and the network would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

Figure 10.3: Services provided at MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - Network side

~~NOTE: Figure 10.3 shall be updated to include the new LCS PD in the same manner as for the other PDs.~~

10.2.1 Service state diagram

The primitives provided by the Mobility Management entity towards Call Control, Short Messages Service Support, Location Services Support (for a type A LMU) and call independent Supplementary Services Support ~~(for type A LMU)~~ as well as the transition between permitted states are illustrated in figure 10.4.



NOTE 1: the parameters in RR_SYNC_CNF must correspond to the parameter in RR_SYNC_REQ.
NOTE 2: MMCC-primitives only at MMCC-SAP.
NOTE 3: The prefix MMXX is used for substitution of MMCC, MMSS, MMLCS (for type A LMU) or MMSMS.

Figure 10.4: Service graph of the Mobility Management entity, towards Call Control - Network side

10.2.2 Service primitives

Table 10.2: Primitives and Parameters at MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - Network side

PRIMITIVES	PARAMETERS	REFERENCE
MMXX_EST_REQ (see note 1)	Mobile ID	10.2.2.1
MMXX_EST_IND (see note 1)	First CM message	10.2.2.2
MMXX_EST_CNF (see note 1)	-	10.2.2.3
MMXX_REL_REQ (see note 1)	cause	10.2.2.4
MMXX_REL_IND (see note 1)	cause	10.2.2.5
MMXX_DATA_REQ (see note 1)	Layer 3 message	10.2.2.6
MMXX_DATA_IND (see note 1)	Layer 3 message	10.2.2.7
MMXX_UNIT_DATA_REQ (see note 1)	Layer 3 message	10.2.2.8
MMXX_UNIT_DATA_IND (see note 1)	Layer 3 message	10.2.2.9
MMCC_SYNC_REQ (see note 2)	cause (resource assign), list of (RAB ID, NAS Synchronization Indicator)	10.2.2.10
MMCC_SYNC_CNF (see note 2)	cause (resource assign)	10.2.2.11
NOTE 1: MMXX is used as substitution for MMCC, MMSS, MMLCS (for type A LMU) or MMSMS. NOTE 2: Only at MMCC-SAP.		

10.2.2.1 MMXX_EST_REQ

Request by CC, SS, LCS (for type A LMU) and SMS respectively, for the establishment of a MM connection.

10.2.2.2 MMXX_EST_IND

Indication by the MM sublayer that a MM connection is established.

10.2.2.3 MMXX_EST_CNF

Confirmation of the MM connection establishment by the MM sublayer.

10.2.2.4 MMXX_REL_REQ

Request by CC, SS, LCS (for type A LMU) or SMS respectively, for the release of the MM connection.

10.2.2.5 MMXX_REL_IND

Indication by the MM sublayer that a MM connection has been released.

10.2.2.6 MMXX_DATA_REQ

Request by the CC, SS, LCS (for type A LMU) or SMS entities for acknowledged control-data transmission.

10.2.2.7 MMXX_DATA_IND

Indication used by MM to transfer the received acknowledged control-data to the CC, SS, LCS (for type A LMU) or SMS entities.

10.2.2.8 MMXX_UNIT_DATA_REQ

Request used by the CC, SS, LCS (for type A LMU) or SMS entities for unacknowledged control-data transmission.

10.2.2.9 MMXX_UNIT_DATA_IND

Indication used by MM to transfer the received unacknowledged control-data to the CC, SS, LCS (for type A LMU) or SMS entities.

10.2.2.10 MMCC_SYNC_REQ

Request used by the CC entity to synchronize with the MM entity (resource assign).

10.2.2.11 MMCC_SYNC_CNF

Confirmation used by the MM to inform the CC entity that synchronization is completed (resource assign).

In Iu mode, the CC entity includes the list of the RAB IDs and, optionally, the NAS Synchronization Indicators associated with the requested radio bearers.

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

11.2.3.1.1 Protocol discriminator

Bits 1 to 4 of the first octet of a standard L3 message contain the protocol discriminator (PD) information element. The PD identifies the L3 protocol to which the standard layer 3 message belongs. The correspondence between L3 protocols and PDs is one-to-one.

For future evolution an extension mechanism is foreseen which allows the use of protocol discriminators with one octet length, where bits 4 to one are coded as 1 1 1 0. Messages of such protocols may not be standard L3 messages. In particular, the rest of the header may not respect the structure described in this sub-clause.

The PD can take the following values:

Table 11.2: Protocol discriminator values

bits 4 3 2 1	
0 0 0 0	group call control
0 0 0 1	broadcast call control
0 0 1 0	Reserved: was allocated in earlier phases of the protocol
0 0 1 1	call control; call related SS messages
0 1 0 0	GPRS Transparent Transport Protocol (GTTP)
0 1 0 1	mobility management messages
0 1 1 0	radio resources management messages
1 0 0 0	GPRS mobility management messages
1 0 0 1	SMS messages
1 0 1 0	GPRS session management messages
1 0 1 1	non call related SS messages
1 1 0 0	Location services specified in 3GPP TS 44.071 [8a]
1 1 1 0	reserved for extension of the PD to one octet length
1 1 1 1	reserved for tests procedures described in ~~[5a]~~ 3GPP TS 44.014 [5a] and ~~[17a]~~ 3GPP TS 34.109 [17a].

If the network receives, on a SAP where it expects standard L3 messages, a message with a protocol discriminator different from those specified in table 11.2, the network may ignore the message or initiate the channel release procedure defined in 3GPP TS 44.018 [6b].

If the Mobile Station receives, on a SAP where it expects standard L3 messages, a standard L3 message with a protocol discriminator different from those specified in table 11.2, or for a protocol that it does not support, the Mobile Station shall ignore the message.

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

11.2.3.2.1 Message type octet (when accessing Release 98 and older networks only)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 98 or older network, the message type IE is coded as shown in figure 11.10a and 11.10x.

Bit 8 is encoded as "0"; value "1" is reserved for possible future use as an extension bit. A protocol entity expecting a standard L3 message, and receiving a message containing bit 8 of octet 2 encoded as "1" shall diagnose a " message not defined for the PD" error and treat the message accordingly.

In messages of MM, CC, SS, GCC, and BCC ~~and LCS~~ protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station or the LMU to the network, bit 7 of octet 2 is used for send sequence number, see subclause 11.2.3.2.3.

In messages of the LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the type A LMU to the network, bit 7 of octet 2 is used for send sequence number, see subclause 11.2.3.2.3.

In all other standard layer 3 messages, except for RR messages, bit 7 is set to a default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR layer, and receiving a message containing bit 7 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 7 is 0 except for the SM protocol where the default value is 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 44.018.

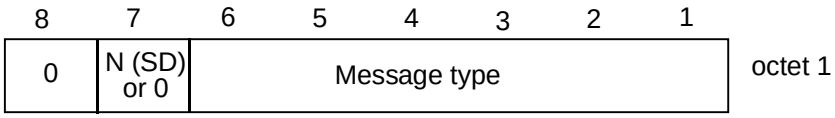


Figure 11.10a: Message type IE (MM, CC, SS, GCC, BCC and LCS)

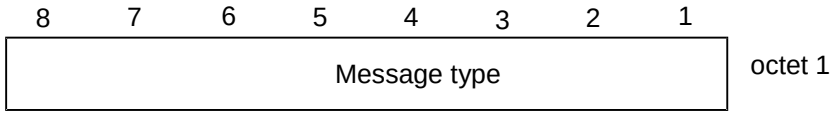


Figure 11.10x: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction and for a given lower layer SAP. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station) and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

11.2.3.2.2 Message type octet (when accessing Release 99 and newer networks)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 99 or later network, the message type IE is coded dependent on the PD as shown in figures 11.10b, c and d.

In messages of MM, CC and SS protocol sent using the transmission functionality provided by the RR and/or access stratum layer to upper layers, and sent from the mobile station or the LMU to the network, bits 7 and 8 of octet 2 are used for send sequence number, see clause 11.2.3.2.3.

In messages of GCC, and BCC and LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station or to the network or, for LCS, sent from the LMU to the network, only bit 7 of octet 2 is used for send sequence number. Bit 8 is set to the default value.

In messages of the LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the type A LMU to the network, only bit 7 of octet 2 is used for send sequence number. Bit 8 is set to the default value.

In all other standard layer 3 messages, except for RR messages, bits 7 and 8 are set to the default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR and/or access stratum layer, and receiving a message containing bit 7 or bit 8 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

In messages of the RR protocol entity, bit 8 of octet 2 is set to the default value. The other value is reserved for possible future use as an extension bit .If an RR protocol entity expecting a standard L3 message receives message containing bit 8 of octet 2 encoded different from the default value it shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 8 is 0. The default value for bit 7 is 0 except for the SM protocol which has a default value of 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 44.018.

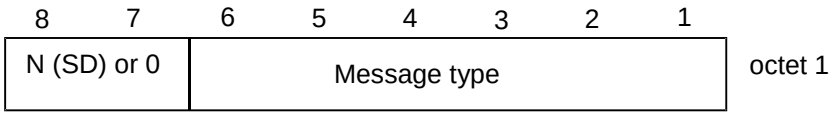


Figure 11.10b: Message type IE (MM, CC and SS)

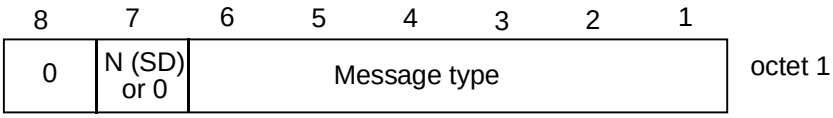


Figure 11.10c: Message type IE (GCC, BCC and LCS)

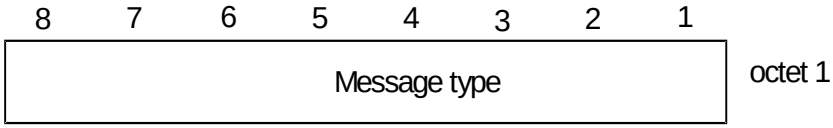


Figure 11.10d: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction and for a given lower layer SAP. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), the direction (the same value may have different meanings in the same protocol, when

sent from the Mobile Station to the network and when sent from the network to the Mobile Station) and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

3GPP TSG-CN1 Meeting #34
Zagreb, Croatia 10 – 14 May 2004

Tdoc N1-040967
(rev of Tdoc N1-040808)

CR-Form-v7

CHANGE REQUEST

⌘ **24.007** **CR** **063** ⌘ **rev** **1** ⌘ Current version: **6.0.0** ⌘

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

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

Title:	⌘	Corrections concerning the use of the LCS protocol
Source:	⌘	Siemens AG
Work item code:	⌘	LCS
Date:	⌘	27.04.2004
Category:	⌘	**A**
Release:	⌘	Rel-6

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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	With LS S2-041015 (N1-040527), SA2 asked for a clarification about the 'nature of location services' and the protocols involved in the signalling for location services. Closer inspection of TS 24.007 showed that the specification contains some inconsistencies with regard to the use of the LCS protocol entity and the protocol discriminators LCS and SS: In some places it needs to be clarified that the LCS entity is only present in a type A LMU (e.g. subclause 4.1 and 6.8), and that the protocol discriminator LCS is only used by these LMUs (e.g. clause 11). The reference to the supplementary service procedures to be used by the MS for location services is missing (clause 2, subclause 4.3.4). It is erroneously stated that an MS uses the LCS protocol when initiating positioning measurements (subclause 6.8). It is erroneously stated that the type A LMU uses the supplementary service protocol instead of the LCS protocol (subclause 10.2.1).
Summary of change:	⌘	Necessary clarifications are added and wrong statements corrected. The text of the notes under figures 5.1, 9.3, and 10.3 which required "(this) figure … shall be updated …" is changed, since apparently this update will not happen.
Consequences if not approved:	⌘	Inconsistent specification which may cause wrong implementations. If the MS uses PD = LCS instead of PD = SS when initiating a mobile originating location request, the request cannot be treated by the network.

Clauses affected:	⌘	2, 4.1, 4.3.4, 5.2, 6.8, 6.8.1, 6.8.2, 7, 7.6, 9.2, 10.2, 10.2.1, 10.2.2, 11.2.3.1.1, 11.2.3.2.1, 11.2.3.2.2			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	
			X Test specifications		
			X O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

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

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

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

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

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] GSM 01.02(R97): "Digital cellular telecommunications system (Phase 2+); General description of a GSM Public Land Mobile Network (PLMN)".

[1a] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.101: "General UMTS Architecture".

[3] 3GPP TS 44.001: "Mobile Station - Base Station System (MS - BSS) interface; General aspects and principles".

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

[3b] GSM 03.56(R98): "Digital cellular telecommunications system (Phase 2+); GSM Cordless Telephony System (CTS), Phase 1; CTS Architecture Description; Stage 2".

[3c] 3GPP TS 23.271: "Functional stage 2 description of location services".

[4] 3GPP TS 44.005: "Data Link (DL) layer; General aspects".

[5] 3GPP TS 44.006: "Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".

[5a] 3GPP TS 44.014: "Individual equipment type requirements and interworking; Special conformance testing functions".

[6] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification Core Network Protocols-Stage 3".

[6a] 3GPP TS 23.108: "Mobile radio interface Layer 3 specification Core Network Protocols Stage 2 (structured procedures)".

[6b] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[7] 3GPP TS 24.010: "Mobile radio interface Layer 3; Supplementary services specification; General aspects".

[8] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[8a] 3GPP TS 44.071: "Location Services (LCS); Mobile radio interface layer 3 LCS specification".

[9] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary services specification; Formats and coding".

[10] 3GPP TS 24.081: "Line identification supplementary services; Stage 3".

[10a] 3GPP TS 44.060: "General Packet Radio Services (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[10b] 3GPP TS 44.056: "GSM Cordless Telephony System (CTS), phase 1; CTS radio interface Layer 3 specification".

[11] 3GPP TS 24.082: "Call Forwarding (CF) supplementary services - Stage 3".

[11a] 3GPP TS 44.064: "General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification".

[12] 3GPP TS 24.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".

[12a] 3GPP TS 44.065: "General Packet Radio Service (GPRS); Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[13] 3GPP TS 24.084: "MultiParty (MPTY) supplementary services; Stage 3".

[14] 3GPP TS 24.085: "Closed User Group (CUG) supplementary services; Stage 3".

[15] 3GPP TS 24.086: "Advice of Charge (AoC) supplementary services; Stage 3".

[16] 3GPP TS 24.088: "Call Barring (CB) supplementary services; Stage 3".

[17] 3GPP TS 24.090: "Unstructured Supplementary Service Data (USSD) - Stage 3".

[17a] 3GPP TS 34.109: "Terminal logical test interface; Special conformance testing functions".

[18] ITU-T Recommendation X.200: "Information technology - Open Systems Interconnection - Basic Reference Model: The basic model".

[19] 3GPP TS 44.068: "Group Call Control (GCC) Protocol".

[20] 3GPP TS 23.110: "UMTS Access Stratum Services and Functions".

[21] 3GPP TS 24.030: "Location Services (LCS); Supplementary service operations – Stage 3".

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

4 Introduction

4.1 General

Three models are defined for Layer 3, one model for non-GPRS services, one for GPRS services supporting Class C MSs only and one model for GPRS-services supporting Class A and Class B MSs. (The third model is a combination of the first two models listed).

The layer 3 for non-GPRS services provides the functions necessary:

- for Radio Resource (RR) management;
- for Mobility Management (MM); and
- for the Connection Management (CM) functions, i.e. functions for the control, provision, and support of services offered by the network; among which there are, e.g.:
  - the functions to establish, maintain and terminate circuit-switched connections across a GSM PLMN and other networks to which the GSM PLMN is connected;
  - supporting functions for supplementary services control;
  - supporting functions for short messages service control;
  - supporting functions for location services control (only for a type A LMU).

The layer 3 for non-GPRS services is composed of three sublayers comprising:

- the Radio Resource Management (RR) functions;

- the Mobility Management (MM) functions; and
- the Connection Management (CM) functions.

When CTS services are added to non-GPRS services, the following functions are added:

- CTS Radio Resource Management (CTS-RR) functions to RR; and
- CTS Mobility Management (CTS-MM) functions to MM.

The layer 3 for GPRS services is composed of four sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (GMM);
- for the Logical Link Control (LLC);
- the Connection Management (CM) functions.

The Connection Management (CM) sublayer is composed of functional blocks for:

- Call Control (CC) for non-GPRS services;
- Short Message Service Support (SMS) for non-GPRS services;
- GPRS Short Message Service Support (GSMS) (for GPRS services supporting Class A, B and C MSs);
- Session Management (SM) (for GPRS services supporting Class A, B and C MSs);
- Supplementary Services Support (SS) for non-GPRS services;
- Group Call Control for non-GPRS services;
- Broadcast Call Control (BCC) for non-GPRS services;
- Connection Management of Packet Data on Signalling channels for non-GPRS services;
- Location Services support (LCS) for non-GPRS services (only for a type A LMU).

Within the context of LCS, for GSM LCS, the services defined for an MS are equally applicable to a type A LMU, unless otherwise stated. However, services defined specifically for a type A LMU are not applicable to an MS. The following is a list of services essential for a type A LMU.

The layer 3 for non-GPRS services provides the functions necessary:

- for Radio Resource (RR) management;
- for Mobility Management (MM); and
- supporting functions for location service control.

The layer 3 for non-GPRS services is composed of three sublayers comprising:

- the Radio Resource Management (RR) functions;
- the Mobility Management (MM) functions; and
- the Connection Management (CM) functions.

The Connection Management (CM) sublayer is composed of functional block for:

- location services support (LCS) for non-GPRS services.

The present document does not consider the distribution of signalling functions among the different network equipments. The signalling functions are described between two systems which represent the MS side and the network side of the radio interface of layer 3. Only the functions in the network for signalling communication with one MS is considered.

For GPRS services, in addition to the signalling functions also the user data transfer is included in the present document.

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

4.3.4 Contents of layer 3 related Technical Specifications

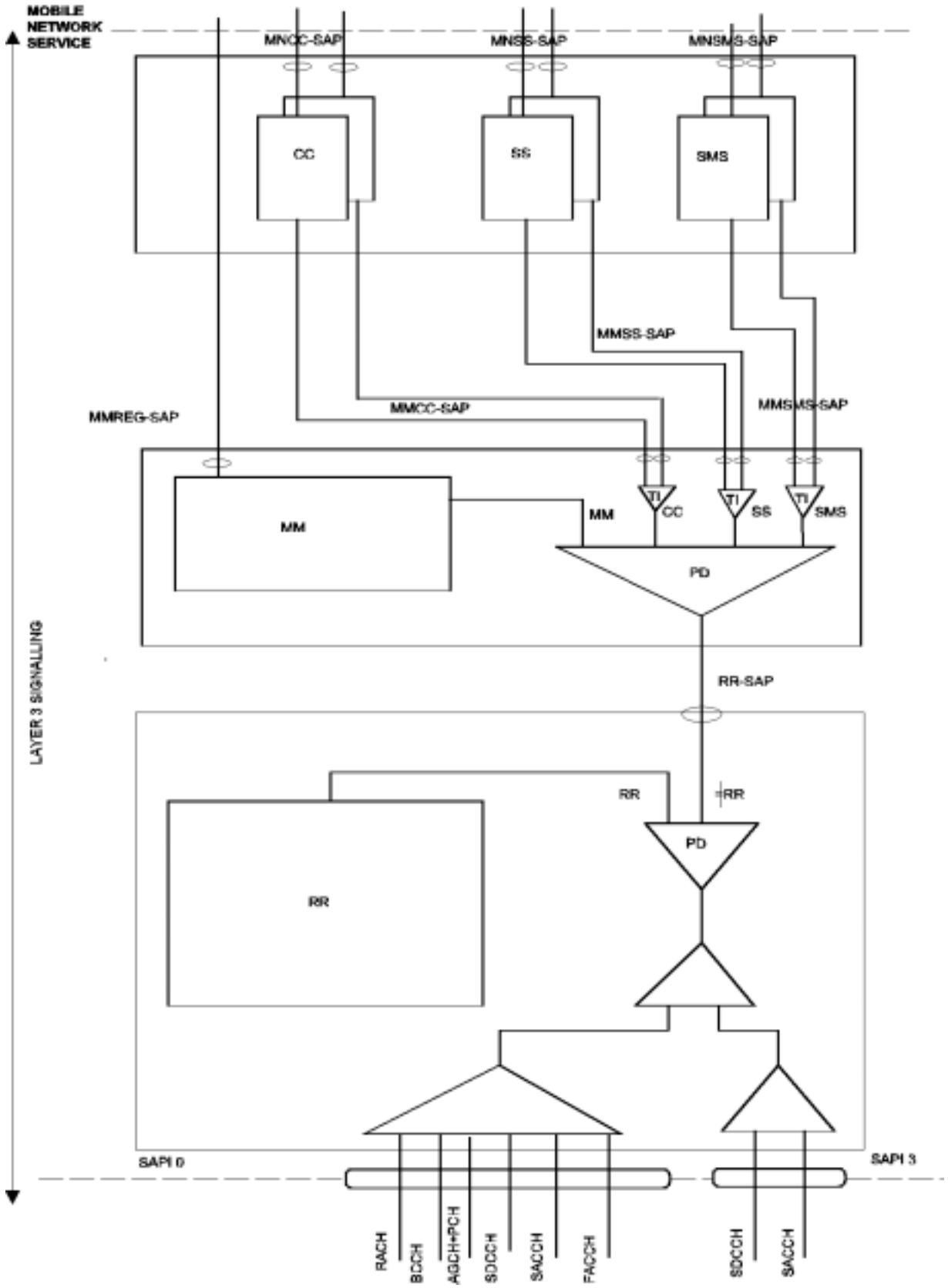
- The Radio Resource (RR) management protocol is defined in 3GPP TS 44.018 [6b];
- the Mobility Management (MM) protocol is defined in 3GPP TS 24.008 [6];
- the Session Management (SM) protocol is defined in 3GPP TS 24.008 [6];
- the Call Control (CC) protocol is defined in 3GPP TS 24.008 [6];
- the Supplementary Services (SS) protocol is defined in 3GPP TS 24.010 [7], 3GPP TS 24.08x, ~~and~~ 3GPP TS 24.09x, and 3GPP TS 24.030 [21];
- the Short Message Service (SMS) protocol is defined in 3GPP TS 24.011 [8];
- the Group Call Control (GCC) protocol is defined in 3GPP TS 44.068 [19];
- the Logical Link Control (LLC) protocol is defined in 3GPP TS 44.064 [11a];
- the GPRS Radio Resource (GRR) protocol is defined in 3GPP TS 44.060 [10a] and 3GPP TS 24.008 [6];
- the CTS Radio Resource (CTS-RR) sub-protocol is defined in 3GPP TS 44.056 [10b];
- the CTS Mobility Management (CTS-MM) sub-protocol is defined in 3GPP TS 44.056 [10b];
- the CTS additions to the Call Control (CC) protocol are defined in 3GPP TS 44.056 [10b];
- the Location Services (LCS) protocol for a type A LMU is defined in 3GPP TS 23.271 [3c] and 3GPP TS 44.071 [8a].

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

5.2 Protocol architecture

The protocol architecture is visualized 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 three~~four~~ paradigmatic examples, CC, ~~LCS,~~ SS, and SMS. The LCS protocol entity of a type A LMU would be included in the same manner. 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.



NOTE: The LCS protocol entity for a type A LMU would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

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.~~

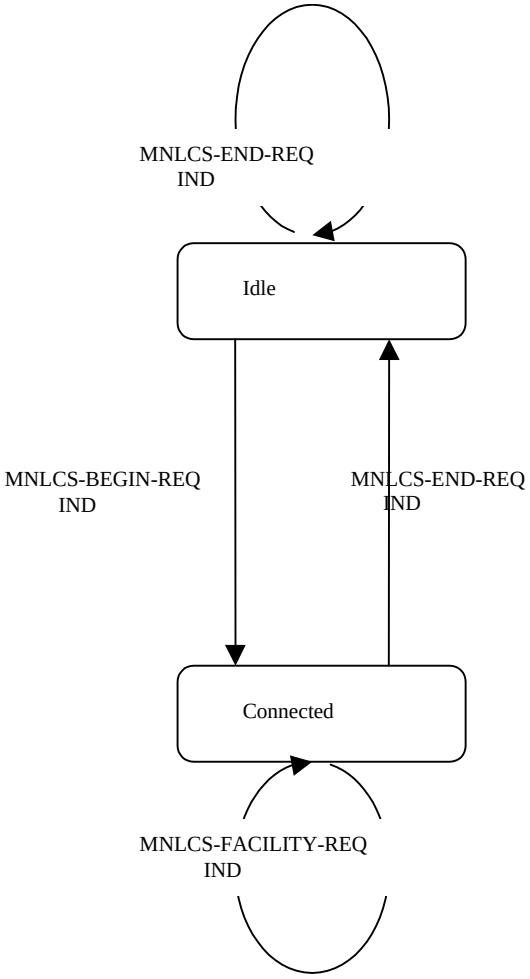
********** NEXT MODIFIED SECTION **********

6.8 Location services at the ~~MS~~ type A LMU side

The location services (~~initiation of positioning measurements at the MS~~e.g. transfer of timing related measurement information by a type A LMU) are provided at the service access point MNLCS-SAP. The service provided by the CM sublayer to support the location services is defined in 3GPP TS 44.071 [8a].

6.8.1 Service state diagram

The positioning services provided at the service access point MNLCS-SAP are illustrated in the state diagram of figure 6.8.



STATES:
IDLE - No LCS signalling transaction pending.
CONN - LCS signalling transaction established.

Figure 6.8: Service graph of the Location Services Support entity - ~~MS~~ type A LMU side

6.8.2 Service primitives

Table 6.8: Primitives and Parameters at MNLCS-SAP - ~~MS~~ type A LMU side

PRIMITIVES	PARAMETERS (Info elements of message)	REFERENCE
MNLCS_BEGIN_REQ	REGISTER	6.8.2.1
MNLCS_BEGIN_IND	REGISTER	6.8.2.2
MNLCS_FACILITY_REQ	FACILITY	6.8.2.3
MNLCS_FACILITY_IND	FACILITY	6.8.2.4
MNLCS_END_REQ	RELEASE COMPLETE	6.8.2.5
MNLCS_END_IND	RELEASE COMPLETE	6.8.2.6

6.8.2.1 MNLCS_BEGIN_REQ

Request to send a REGISTER message in order to establish a signalling transaction for the provision of location services. The request for transfer of a location service facility may be included.

6.8.2.2 MNLCS_BEGIN_IND

Receipt of a REGISTER message, a signalling transaction is established for the provision of location services after receipt of a REGISTER message. The indication of a location service facility may be included.

6.8.2.3 MNLCS_FACILITY_REQ

Request to send a FACILITY message for the provision of a location service invocation. The request for transfer of a location service facility may be included.

6.8.2.4 MNLCS_FACILITY_IND

Receipt of a FACILITY message, a location service facility has been requested.

6.8.2.5 MNLCS_END_REQ

Request to send a RELEASE COMPLETE message in order to release the signalling transaction. The request for transfer of a location service facility may be included.

6.8.2.6 MNLCS_END_IND

Receipt of a RELEASE COMPLETE message, the signalling transaction has been released. The indication of a location service facility may be included.

7 Services provided by signalling layer 3 on the Network side

In this clause, the services provided by signalling layer 3 on the network side are described which belong to the CM sub-layer functional blocks of CC, SMS, LCS, and SS. The services corresponding to further functional blocks of the CM sublayer are not further described in this clause.

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

7.6 Location services at the Network side

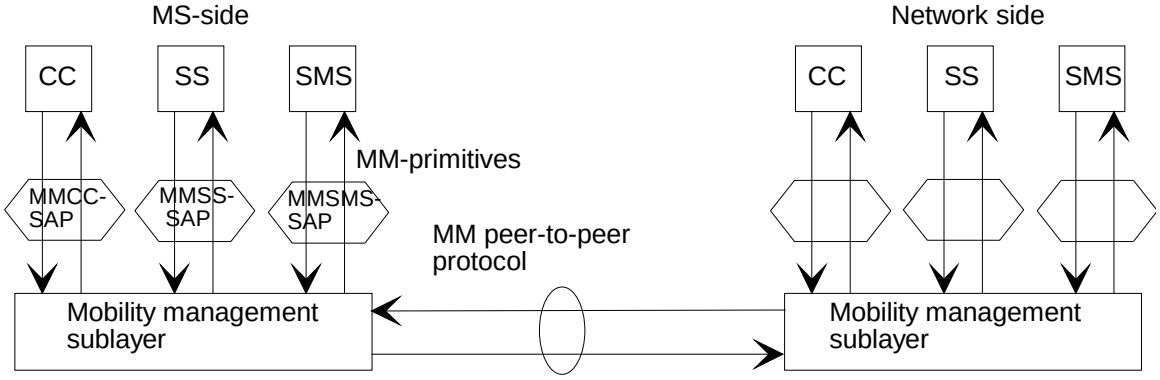
The location services (e.g. network initiation of timing related ~~location~~ measurements in a type A LMU~~at the network~~) are provided at the service access point MNLCS-SAP. The service provided by the CM sublayer to support the location services is defined in 3GPP TS 44.071 [8a] (for communication with a type A LMU only).

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

9.2 Services provided by the Mobility Management entity

The Mobility Management (MM) sublayer provides services to the Call Control (CC) entity, the Supplementary Services Support (SS) entity, the Location Services (LCS) entity (only for type A LMU) and the Short Message Service Support (SMS) entity.

The Mobility Management services primitives are discriminated by the MMCC, MMSS, MMLCS and MMSMS prefix.



NOTE: The LCS protocol entities for communication between a type A LMU and the network would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

Figure 9.3: Services provided at the MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - MS side

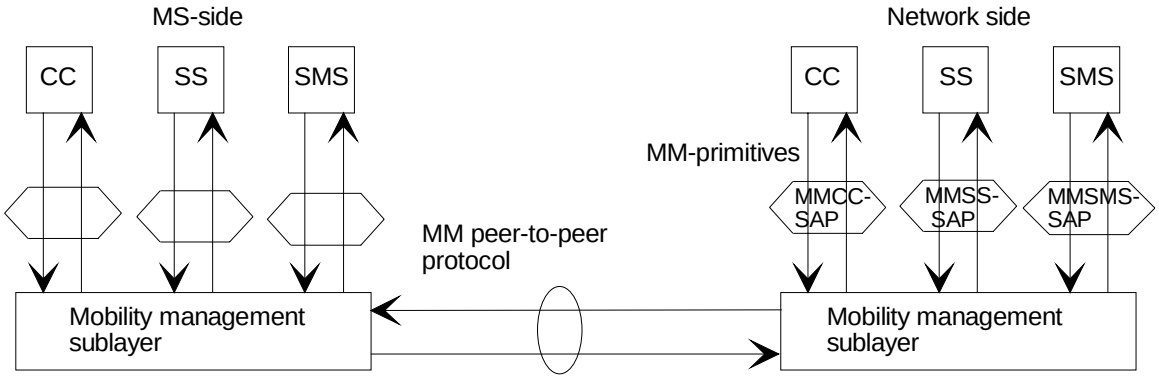
~~NOTE: Figure 9.3 shall be updated to include the LCS PD in the same manner as the other PDs are shown.~~

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

10.2 Services provided by the Mobility Management entity

The Mobility Management (MM) sublayer provides services to the Call Control (CC) entity, the Supplementary Service Support (SS) entity, the Location Services (LCS) (for type A LMU) and the Short Message Service Support (SMS) entity.

The Mobility Management services primitives are recognized by the MMCC, MMSS, MMLCS and MMSMS prefix.



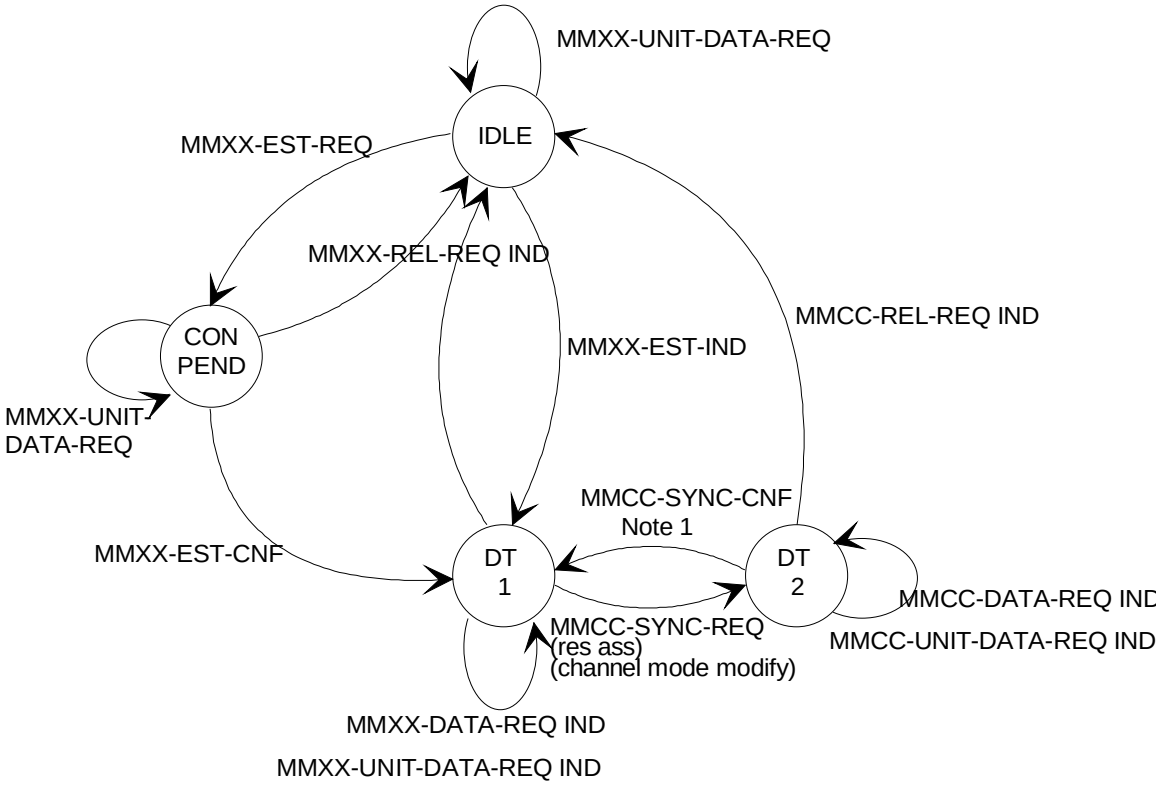
NOTE: The LCS protocol entities for communication between a type A LMU and the network would be included in the figure in the same manner as the protocol entities for CC, SS and SMS.

Figure 10.3: Services provided at MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - Network side

~~NOTE: Figure 10.3 shall be updated to include the new LCS PD in the same manner as for the other PDs.~~

10.2.1 Service state diagram

The primitives provided by the Mobility Management entity towards Call Control, Short Messages Service Support, Location Services Support (for a type A LMU) and call independent Supplementary Services Support ~~(for type A LMU)~~ as well as the transition between permitted states are illustrated in figure 10.4.



NOTE 1: the parameters in RR_SYNC_CNF must correspond to the parameter in RR_SYNC_REQ.
NOTE 2: MMCC-primitives only at MMCC-SAP.
NOTE 3: The prefix MMXX is used for substitution of MMCC, MMSS, MMLCS (for type A LMU) or MMSMS.

Figure 10.4: Service graph of the Mobility Management entity, towards Call Control - Network side

10.2.2 Service primitives

Table 10.2: Primitives and Parameters at MMCC-SAP, MMSS-SAP, MMLCS-SAP, MMSMS-SAP - Network side

PRIMITIVES	PARAMETERS	REFERENCE
MMXX_EST_REQ (see note 1)	Mobile ID	10.2.2.1
MMXX_EST_IND (see note 1)	First CM message	10.2.2.2
MMXX_EST_CNF (see note 1)	-	10.2.2.3
MMXX_REL_REQ (see note 1)	cause	10.2.2.4
MMXX_REL_IND (see note 1)	cause	10.2.2.5
MMXX_DATA_REQ (see note 1)	Layer 3 message	10.2.2.6
MMXX_DATA_IND (see note 1)	Layer 3 message	10.2.2.7
MMXX_UNIT_DATA_REQ (see note 1)	Layer 3 message	10.2.2.8
MMXX_UNIT_DATA_IND (see note 1)	Layer 3 message	10.2.2.9
MMCC_SYNC_REQ (see note 2)	cause (resource assign), list of (RAB ID, NAS Synchronization Indicator)	10.2.2.10
MMCC_SYNC_CNF (see note 2)	cause (resource assign)	10.2.2.11
NOTE 1: MMXX is used as substitution for MMCC, MMSS, MMLCS (for type A LMU) or MMSMS. NOTE 2: Only at MMCC-SAP.		

10.2.2.1 MMXX_EST_REQ

Request by CC, SS, LCS (for type A LMU) and SMS respectively, for the establishment of a MM connection.

10.2.2.2 MMXX_EST_IND

Indication by the MM sublayer that a MM connection is established.

10.2.2.3 MMXX_EST_CNF

Confirmation of the MM connection establishment by the MM sublayer.

10.2.2.4 MMXX_REL_REQ

Request by CC, SS, LCS (for type A LMU) or SMS respectively, for the release of the MM connection.

10.2.2.5 MMXX_REL_IND

Indication by the MM sublayer that a MM connection has been released.

10.2.2.6 MMXX_DATA_REQ

Request by the CC, SS, LCS (for type A LMU) or SMS entities for acknowledged control-data transmission.

10.2.2.7 MMXX_DATA_IND

Indication used by MM to transfer the received acknowledged control-data to the CC, SS, LCS (for type A LMU) or SMS entities.

10.2.2.8 MMXX_UNIT_DATA_REQ

Request used by the CC, SS, LCS (for type A LMU) or SMS entities for unacknowledged control-data transmission.

10.2.2.9 MMXX_UNIT_DATA_IND

Indication used by MM to transfer the received unacknowledged control-data to the CC, SS, LCS (for type A LMU) or SMS entities.

10.2.2.10 MMCC_SYNC_REQ

Request used by the CC entity to synchronize with the MM entity (resource assign).

10.2.2.11 MMCC_SYNC_CNF

Confirmation used by the MM to inform the CC entity that synchronization is completed (resource assign).

In Iu mode, the CC entity includes the list of the RAB IDs and, optionally, the NAS Synchronization Indicators associated with the requested radio bearers.

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

11.2.3.1.1 Protocol discriminator

Bits 1 to 4 of the first octet of a standard L3 message contain the protocol discriminator (PD) information element. The PD identifies the L3 protocol to which the standard layer 3 message belongs. The correspondence between L3 protocols and PDs is one-to-one.

For future evolution an extension mechanism is foreseen which allows the use of protocol discriminators with one octet length, where bits 4 to one are coded as 1 1 1 0. Messages of such protocols may not be standard L3 messages. In particular, the rest of the header may not respect the structure described in this sub-clause.

The PD can take the following values:

Table 11.2: Protocol discriminator values

bits 4 3 2 1	
0 0 0 0	group call control
0 0 0 1	broadcast call control
0 0 1 0	Reserved: was allocated in earlier phases of the protocol
0 0 1 1	call control; call related SS messages
0 1 0 0	GPRS Transparent Transport Protocol (GTTP)
0 1 0 1	mobility management messages
0 1 1 0	radio resources management messages
1 0 0 0	GPRS mobility management messages
1 0 0 1	SMS messages
1 0 1 0	GPRS session management messages
1 0 1 1	non call related SS messages
1 1 0 0	Location services specified in 3GPP TS 44.071 [8a]
1 1 1 0	reserved for extension of the PD to one octet length
1 1 1 1	reserved for tests procedures described in ~~[5a]~~ 3GPP TS 44.014 [5a] and ~~[17a]~~ 3GPP TS 34.109 [17a].

If the network receives, on a SAP where it expects standard L3 messages, a message with a protocol discriminator different from those specified in table 11.2, the network may ignore the message or initiate the channel release procedure defined in 3GPP TS 44.018 [6b].

If the Mobile Station receives, on a SAP where it expects standard L3 messages, a standard L3 message with a protocol discriminator different from those specified in table 11.2, or for a protocol that it does not support, the Mobile Station shall ignore the message.

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

11.2.3.2 Message type octet

11.2.3.2.1 Message type octet (when accessing Release 98 and older networks only)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 98 or older network, the message type IE is coded as shown in figure 11.10a and 11.10x.

Bit 8 is encoded as "0"; value "1" is reserved for possible future use as an extension bit. A protocol entity expecting a standard L3 message, and receiving a message containing bit 8 of octet 2 encoded as "1" shall diagnose a " message not defined for the PD" error and treat the message accordingly.

In messages of MM, CC, SS, GCC, and BCC ~~and LCS~~ protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station or the LMU to the network, bit 7 of octet 2 is used for send sequence number, see subclause 11.2.3.2.3.

In messages of the LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the type A LMU to the network, bit 7 of octet 2 is used for send sequence number, see subclause 11.2.3.2.3.

In all other standard layer 3 messages, except for RR messages, bit 7 is set to a default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR layer, and receiving a message containing bit 7 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 7 is 0 except for the SM protocol where the default value is 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 44.018.

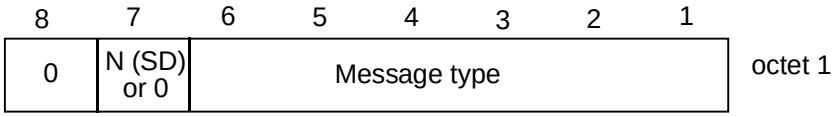


Figure 11.10a: Message type IE (MM, CC, SS, GCC, BCC and LCS)

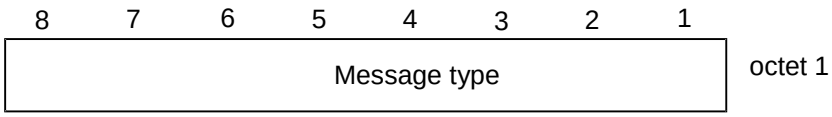


Figure 11.10x: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), and the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

11.2.3.2.2 Message type octet (when accessing Release 99 and newer networks)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 99 or later network, the message type IE is coded dependent on the PD as shown in figures 11.10b, c and d.

In messages of MM, CC and SS protocol sent using the transmission functionality provided by the RR and/or access stratum layer to upper layers, and sent from the mobile station or the LMU to the network, bits 7 and 8 of octet 2 are used for send sequence number, see clause 11.2.3.2.3.

In messages of GCC~~,~~ and BCC ~~and LCS~~ protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station or~~to the network or, for LCS, sent from~~ the LMU to the network, only bit 7 of octet 2 is used for send sequence number. Bit 8 is set to the default value.

In messages of the LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the type A LMU to the network, only bit 7 of octet 2 is used for send sequence number. Bit 8 is set to the default value.

In all other standard layer 3 messages, except for RR messages, bits 7 and 8 are set to the default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR and/or access stratum layer, and receiving a message containing bit 7 or bit 8 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

In messages of the RR protocol entity, bit 8 of octet 2 is set to the default value. The other value is reserved for possible future use as an extension bit .If an RR protocol entity expecting a standard L3 message receives message containing bit 8 of octet 2 encoded different from the default value it shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 8 is 0. The default value for bit 7 is 0 except for the SM protocol which has a default value of 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 44.018.

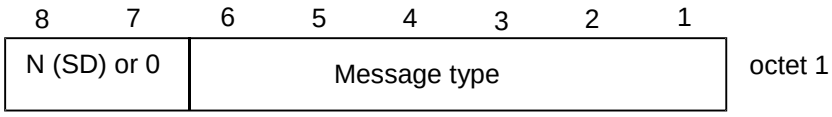


Figure 11.10b: Message type IE (MM, CC and SS)

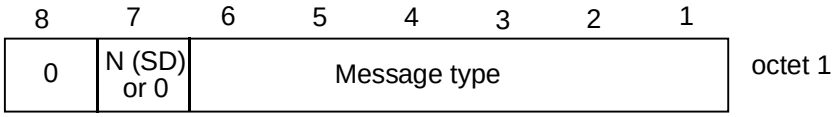


Figure 11.10c: Message type IE (GCC, BCC and LCS)

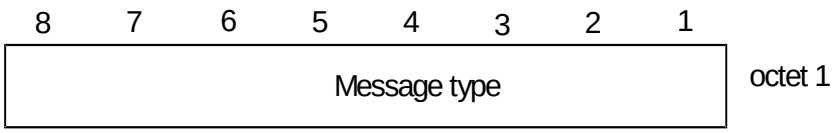


Figure 11.10d: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), and the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

3GPP TSG-CN1 Meeting #34
Zagreb, Croatia 10 – 14 May 2004

Tdoc N1-040968
(rev of Tdoc N1-040809)

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **853** ⌘ **rev** **1** ⌘ Current version: **3.18.0** ⌘

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

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

Title:	⌘	Clarification of the use of service type 'Location services'
Source:	⌘	Siemens
Work item code:	⌘	LCS
Date:	⌘	28.04.2004
Category:	⌘	**F**
Release:	⌘	R99

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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	In LS S2-041015 (N1-040527), SA2 asked for a clarification about the 'nature of location services' and the protocols involved in the signalling for location services. Since for the feature 'location services' there are different protocols specified for the radio interface (TS 24.080, TS 04.71), the condition when to use the CM service type 'Location Services' should be clarified.
Summary of change:	⌘	A clarification is added when the CM service type 'Location Services' shall be used.
Consequences if not approved:	⌘	Possible misinterpretation and wrong implementation of the specification. A network needs to support the CM service type 'Location Services' only, if it supports communication with type A LMUs. If the network does not support communication with these LMUs and an MS uses CM service type 'Location Services' when asking for an MM connection for a mobile originated location request, the network can reject the CM service request and the MS does not get location services.

Clauses affected:	⌘	10.5.3.3			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

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

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

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

10.5.3.3 CM service type

The purpose of the *CM Service Type* information element is to specify which service is requested from the network.

The *CM Service Type* information element is coded as shown in figure 10.5.77/3GPP TS 24.008 and table 10.5.91/3GPP TS 24.008.

The *CM Service Type* is a type 1 information element.

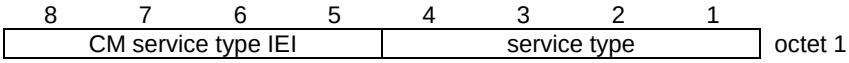


Figure 10.5.77/3GPP TS 24.008 *CM Service Type* information element

Table 10.5.91/3GPP TS 24.008: *CM Service Type* information element

Service type (octet 1)				
Bits				
4	**3**	**2**	**1**	
0	0	0	1	Mobile originating call establishment or packet mode connection establishment
0	0	1	0	Emergency call establishment
0	1	0	0	Short message service
1	0	0	0	Supplementary service activation
1	0	0	1	Voice group call establishment
1	0	1	0	Voice broadcast call establishment
1	0	1	1	Location Services (NOTE)
All other values are reserved.				
NOTE: this service type shall only be used by a type A LMU if the MM connection was requested for the transmission of LCS signalling messages specified in 3GPP TS 04.71 [23a].				

3GPP TSG-CN1 Meeting #34
Zagreb, Croatia 10 – 14 May 2004

Tdoc N1-040969
(rev of Tdoc N1-040810)

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **854** ⌘ **rev** **1** ⌘ Current version: **4.13.0** ⌘

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

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

Title:	⌘	Clarification of the use of service type 'Location services'
Source:	⌘	Siemens
Work item code:	⌘	LCS
Date:	⌘	28.04.2004
Category:	⌘	**A**
Release:	⌘	Rel-4

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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	In LS S2-041015 (N1-040527), SA2 asked for a clarification about the 'nature of location services' and the protocols involved in the signalling for location services. Since for the feature 'location services' there are different protocols specified for the radio interface (TS 24.080, TS 44.071), the condition when to use the CM service type 'Location Services' should be clarified.
Summary of change:	⌘	A clarification is added when the CM service type 'Location Services' shall be used.
Consequences if not approved:	⌘	Possible misinterpretation and wrong implementation of the specification. A network needs to support the CM service type 'Location Services' only, if it supports communication with type A LMUs. If the network does not support communication with these LMUs and an MS uses CM service type 'Location Services' when asking for an MM connection for a mobile originated location request, the network can reject the CM service request and the MS does not get location services.

Clauses affected:	⌘	10.5.3.3

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

Other comments:	⌘	

How to create CRs using this form:

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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.

10.5.3.3 CM service type

The purpose of the *CM Service Type* information element is to specify which service is requested from the network.

The *CM Service Type* information element is coded as shown in figure 10.5.77/3GPP TS 24.008 and table 10.5.91/3GPP TS 24.008.

The *CM Service Type* is a type 1 information element.

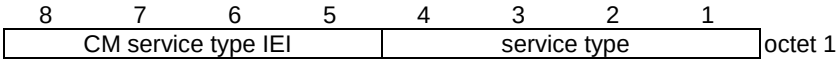

Figure 10.5.77/3GPP TS 24.008 *CM Service Type* information element

Table 10.5.91/3GPP TS 24.008: *CM Service Type* information element

Service type (octet 1)				
Bits				
4	**3**	**2**	**1**	
0	0	0	1	Mobile originating call establishment or packet mode connection establishment
0	0	1	0	Emergency call establishment
0	1	0	0	Short message service
1	0	0	0	Supplementary service activation
1	0	0	1	Voice group call establishment
1	0	1	0	Voice broadcast call establishment
1	0	1	1	Location Services (NOTE)
All other values are reserved.				
NOTE: this service type shall only be used by a type A LMU if the MM connection was requested for the transmission of LCS signalling messages specified in 3GPP TS 44.071 [23a].				

3GPP TSG-CN1 Meeting #34
Zagreb, Croatia 10 – 14 May 2004

Tdoc N1-040970
(rev of Tdoc N1-040811)

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **855** ⌘ **rev** **1** ⌘ Current version: **5.11.0** ⌘

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

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

Title:	⌘	Clarification of the use of service type 'Location services'
Source:	⌘	Siemens
Work item code:	⌘	LCS
Date:	⌘	28.04.2004
Category:	⌘	**A**
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	In LS S2-041015 (N1-040527), SA2 asked for a clarification about the 'nature of location services' and the protocols involved in the signalling for location services. Since for the feature 'location services' there are different protocols specified for the radio interface (TS 24.080, TS 44.071), the condition when to use the CM service type 'Location Services' should be clarified.
Summary of change:	⌘	A clarification is added when the CM service type 'Location Services' shall be used.
Consequences if not approved:	⌘	Possible misinterpretation and wrong implementation of the specification. A network needs to support the CM service type 'Location Services' only, if it supports communication with type A LMUs. If the network does not support communication with these LMUs and an MS uses CM service type 'Location Services' when asking for an MM connection for a mobile originated location request, the network can reject the CM service request and the MS does not get location services.

Clauses affected:	⌘	10.5.3.3

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

Other comments:	⌘	

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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.

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The *CM Service Type* is a type 1 information element.

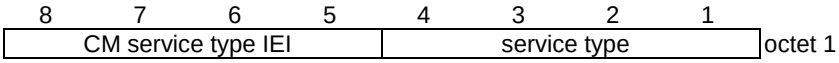

Figure 10.5.77/3GPP TS 24.008 *CM Service Type* information element

Table 10.5.91/3GPP TS 24.008: *CM Service Type* information element

Service type (octet 1)				
Bits				
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0	0	1	0	Emergency call establishment
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1	0	0	0	Supplementary service activation
1	0	0	1	Voice group call establishment
1	0	1	0	Voice broadcast call establishment
1	0	1	1	Location Services (NOTE)
All other values are reserved.				
NOTE: this service type shall only be used by a type A LMU if the MM connection was requested for the transmission of LCS signalling messages specified in 3GPP TS 44.071 [23a].				

3GPP TSG-CN1 Meeting #34
Zagreb, Croatia 10 – 14 May 2004

Tdoc N1-040971
(rev of Tdoc N1-040812)

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **856** ⌘ **rev** **1** ⌘ Current version: **6.4.0** ⌘

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

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

Title:	⌘	Clarification of the use of service type 'Location services'
Source:	⌘	Siemens
Work item code:	⌘	LCS
Date:	⌘	28.04.2004
Category:	⌘	**A**
Release:	⌘	Rel-6

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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	In LS S2-041015 (N1-040527), SA2 asked for a clarification about the 'nature of location services' and the protocols involved in the signalling for location services. Since for the feature 'location services' there are different protocols specified for the radio interface (TS 24.080, TS 44.071), the condition when to use the CM service type 'Location Services' should be clarified.
Summary of change:	⌘	A clarification is added when the CM service type 'Location Services' shall be used.
Consequences if not approved:	⌘	Possible misinterpretation and wrong implementation of the specification. A network needs to support the CM service type 'Location Services' only, if it supports communication with type A LMUs. If the network does not support communication with these LMUs and an MS uses CM service type 'Location Services' when asking for an MM connection for a mobile originated location request, the network can reject the CM service request and the MS does not get location services.

Clauses affected:	⌘	10.5.3.3			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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The *CM Service Type* is a type 1 information element.

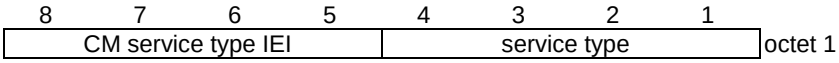

Figure 10.5.77/3GPP TS 24.008 *CM Service Type* information element

Table 10.5.91/3GPP TS 24.008: *CM Service Type* information element

Service type (octet 1)				
Bits				
4	**3**	**2**	**1**	
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1	0	1	0	Voice broadcast call establishment
1	0	1	1	Location Services (NOTE)
All other values are reserved.				
NOTE: this service type shall only be used by a type A LMU if the MM connection was requested for the transmission of LCS signalling messages specified in 3GPP TS 44.071 [23a].				