Technical Specification Group Services and System Aspects
Meeting #15, Cheju Island, Korea, 11-14 March 2002

TSGS#15(02)0035

Source: **SA5 (Telecom Management)**

Title: **Rel-5 CR 32.205 (CS charging) Addition of Charging Data Record definition for Location Service in CS domain**

Document for: **Decision**

Agenda Item: **7.5.3**

Doc-1st-Level	Spec	CR	I	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level	Workitem
SP-020023	32.205	002		Rel-5	**Addition of Charging Data Record definition for Location Service in CS domain**	B	4.1.0	5.0.0	S5-020181	OAM-CH

3GPP TSG-SA5 (Telecom Management) **S5-020181**
Meeting #26, Miami / FL, USA, 25 February - 1 March 2002 **S5B020158**

CR-Form-v5

CHANGE REQUEST

⌘ **32.205 CR 002** ⌘**rev** **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘	Addition of Charging Data Record definition for Location Service in CS domain
Source:	⌘	SA5
Work item code:	⌘	OAM-CH
Date:	⌘	01/03/2002
Category:	⌘	**B**
Release:	⌘	REL-5

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

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

Reason for change: ⌘ Introduction of the the CDR definitions for LCS

Summary of change: ⌘ In the context of service related charging for LCS the CDRs generated within the MSC in 2G and 3G configuration are defined within this Tdoc based on the stage 2 service description of LCS in TS 23.271.

There are three situations of LCS to be distinguished:

1) Mobile Terminated Location request (MT-LR)
   In this case the LR is triggered by an external client. The request is completed with routing info etc. by the GMLC and sent to the MSC. For privacy reasons there might be a user notification necessary, before the LR is performed. Depending on the capabilities of RAN and MS and the requestted accuracy the proper position method is choosen.
   The result is sent back to MSC and via GMLC forwarded to the external LCS client.

2) Mobile Originated Location Request (MO-LR)
   The MO-LR is initially induced by the MS.This LR may be performed with involvement of an external client, however it is also possible that the location information is not transferred to an GMLC or external LCS client. In both situations there is service related data that may be collected in the MSC for allowing the operator billing of this service.

3) Network Induced Location Request (NI-LR)
   This LR is induced by the network, e.g. in case of emergency call. Other applications are possible. When the NI-LR is performed, again specific data is generated which might be collected for billing purpose.

Since the generated data in all of the three cases is not only slightly different it is proposed to introduce three separate kinds of charging records. The service related charging information may be collected and allow the operator more flexibility for billing.

Consequences if not approved:	⌘	No charging for this service possible especially for operators serving the visited PLMN.

Clauses affected:	⌘	2, 3, 4, 5, 6		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary: 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications cane 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] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.003: "Numbering, addressing and identification".

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

[4] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network Protocols; Stage 3".

[5] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

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

[7] ISO 8824-1 (1994)/ITU-T Recommendation X.680 (1994): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[8] ITU-T Recommendation X.208: "Specification of Abstract Syntax Notation One (ASN.1)"

[9] ITU-T Recommendation X.209: "Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1)"

[10] 3GPP TS 22.024: "Description of Charge Advice Information (CAI)".

[11] 3GPP TS 22.086: "Advice of Charge (AoC) supplementary services - Stage 1".

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

[13] 3GPP TS 29.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3; CAMEL Application Part (CAP) specification".

[14] ITU-T Recommendation Q.767: "Application of the ISDN user part of CCITT signalling System No.7 for international ISDN interconnections".

[15] 3GPP TS 23.040: "Technical Realization of Short Message Service (SMS)".

[16] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[17] 3GPP TS 23.002: "Network Architecture".

[18] 3GPP TS 22.115: "Service aspects; Charging and Billing".

[19] 3GPP TS 22.004: "General on Supplementary Services".

[20] 3GPP TS 22.003: "Circuit Teleservices Supported by a Public Land Mobile Network (PLMN)".

[21] 3GPP TS 22.002: "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".

[22] 3GPP TS 32.200: "Telecommunication management; Charging management; Charging Principles"

[23] 3GPP TS 32.215: "3G Telecom Management; Charging management; Charging data description for the Packet Switched (PS) domain".

[24] 3GPP TS 32.235: "Telecommunication management; Charging management; Charging data description for application services".

[25] GSM 12.01: "Network Management (NM); Part 2: Common aspects of GSM/DCS 1800 network management".

[26] IETF RFC 959 (1985): "File Transfer Protocol"; J. Postel, J. Reynolds, ISI.

[27] IETF RFC 783 (1981): "TFTP Protocol (revision 2)"; K.R. Sollins MIT.[28] GSM 05.01: "Physical layer on the radio path; General description".

[29] GSM 08.08: "Mobile-services Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification".

[30] ITU-T Recommendation X.25: "Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".

[31] 3GPP TS 49.031: “Location Services (LCS); Base Station System Application Part, LCS Extension (BSSAP-LE)”.

[32] 3GPP TS 24.080:” Mobile radio interface layer 3 supplementary services specification; Formats and coding”.

3 Definitions, abbreviations and symbols

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply. Additional applicable abbreviations can be found in TR 21.905 [1].

AoC	Advice of Charge
BCSM	Basic Call State Model
CAI	Charge Advice Information
CAMEL	Customised Applications for Mobile network Enhanced Logic
CDR	Call Detail Record
DP	Detection Point
EDP	Event Detection Point
EIR	Equipment Identity Register
EMS-Digits	North American Emergency Service Routing Digits
EMS-Key	North American Emergency Service Routing Key
ETSI	European Telecommunications Standard Institute
FCI	Furnish Charging Information
FTAM	File Transfer, Access and Management
GMSC	Gateway MSC
gsmSCF	GSM Service Control Function
gsmSSF	GSM Service Switching Function
HLR	Home Location Register
HPLMN	Home PLMN
HSCSD	High Speed Circuit Switched Data
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
ISDN	Integrated Services Digital Network
LAC	Location Area Code
LR	Location Request
MLC	Mobile Location Center
MOC	Mobile Originated Call (attempt)
MO-LR	Mobile Originated Location Request
MS	Mobile Station

MSC	Mobile Switching Centre
MSRN	Mobile Station Roaming Number
MTC	Mobile Terminated Call (attempt)
MT-LR	Mobile Terminated Location Request
NE	Network Element
NI-LR	Network Induced Location Request
O_CSI	Originating CAMEL Subscription Information
PLMN	Public Land Mobile Network
SAC	Service Area Code
SCF	Service Control Function
SCI	Subscriber Controlled Input or Send Charging Information
SMS	Short Message Service
SS7	Signalling System No. 7
T_CSI	Terminating CAMEL Subscription Information
TDP	Trigger Detection Point
TMN	Telecommunications Management Network
USIM	User Service Identity Module
USSD	Unstructured Supplementary Service Data
UTRAN	UMTS Terrestrial Radio Access Network
VAS	Value Added Service
VLR	Visitor Location Register
VMSC	Visited MSC
VPLMN	Visited PLMN
VT-CSI	Visited Terminating CAMEL Subscription Information

4 Record types and contents

4.20 Mobile terminated location request (MT-LR)

If enabled, an LCS-MT record shall be produced, within the visited MSC, for each mobile a terminated location request is performed for.

Table 20: LCS-MT record

Field	2G	3G	Description
Record Type	M	M	LCS-MT record.
Recording Entity	M	M	The E.164 number of the visited MSC producing the record.
LCS Client Type	M	M	The type of the LCS client that invoked the LR.
LCS Client Identity	M	M	Further identification of the LCS client .
Served IMSI	M	M	The IMSI of the subscriber the LR is invoked for.
Served MSISDN	O_M	O_M	The MSISDN of the subscriber the LR is invoked for.
Location Type	M	M	The type of the location request.
LCS QoS	C	C	QoS of the LR, if available.
LCS Priority	C	C	Priority of the LR, if available.
MLC Number	M	M	The E.164 address of the requesting GMLC.
Event Time Stamp	M	M	The time at which the LR was received by the MSC.
MeasureDuration	O_M	O_M	The duration of proceeding the location request .
Notification To MS User	C	C	The privacy notification to MS user that was applicable when the LR was invoked, if available.
Privacy Override	C	C	This parameter indicates if MS privacy was overridden by the LCS client, if available.
Location	O_M	-	The LAC and CI when the LR is received.
Location Estimate	O_C	O_C	The location estimate for the subscriber if contained in geographic position and the LR was successful.
Positioning Data	C	C	The positioning method used or attempted, if available.
LCS Cause	C	C	The result of the LR if any failure or partial success happened.
Diagnostics	C	C	A more detailed infromation about the LCS cause if any failure or partial success happened.

Field	2G	3G	Description
System Type	-	M	This field indicates the use of GERAN or UTRAN at the time of the LCS request. This field is present when either the UTRAN or GERAN air-interface is used on call setup.
Record extensions	O_C	O_C	A set of network/ manufacturer specific extensions to the record.

4.21 Mobile originated location request (MO-LR)

If enabled, an LCS-MO record shall be produced, within the visited MSC, for each mobile an originated location request is performed for.

Table 21: LCS-MO record

Field	2G	3G	Description
Record Type	M	M	LCS-MO record.
Recording Entity	M	M	The E.164 number of the visited MSC producing the record.
LCS Client Type	C	C	The type of the LCS client that invoked the LR, if available.
LCS Client Identity	C	C	Further identification of the LCS client, if available.
Served IMSI	M	M	The IMSI of the subscriber the LR is invoked for.
Served MSISDN	O_M	O_M	The MSISDN of the subscriber the LR is invoked for.
MOLR Type	M	M	The type of the LR.
LCS QoS	C	C	QoS of the LR, if available.
LCS Priority	O_C	O_C	Priority of the LR, if available.
MLC Number	C	C	The E.164 address of the involved GMLC, if available.
Event Time Stamp	M	M	The time at which the LR was received by the MSC.
MeasureDuration	O_M	O_M	The duration of proceeding the location request .
Location Estimate	O_C	O_C	The location estimate for the subscriber if contained in geographic position and the LR was successful.
Positioning Data	C	C	The positioning method used or attempted, if available.
LCS Cause	C	C	The result of the LR if any failure or partial success happened.
Diagnostics	C	C	A more detailed infromation about the LCS cause if any failure or partial success happened.
System Type	-	M	This field indicates the use of GERAN or UTRAN at the time of the LCS request. This field is present when either the UTRAN or GERAN air-interface is used on call setup.
Record extensions	O_C	O_C	A set of network/ manufacturer specific extensions to the record.

4.22 Network induced location request (NI-LR)

If enabled, an LCS-NI record shall be produced, within the visited MSC, for each network induced location request performed for a MS e.g. in case of emergency call.

Table 22: LCS-NI record

Field	2G	3G	Description
Record Type	M	M	LCS-NI record.
Recording Entity	M	M	The E.164 number of the visited MSC producing the record.
LCS Client Type	C	C	The type of the LCS client that invoked the LR, if available.
LCS Client Identity	C	C	Further identification of the LCS client, if available.
Served IMSI	C	C	The IMSI of the calling party the LR is executed for if supplied by the UE.
Served MSISDN	C	C	The MSISDN of the calling party the LR is executed for if supplied by the UE.
Served IMEI	C	C	The IMEI of the calling party the LR is executed for if available.
EMS-Digits	O_C	O_C	The emergency service routing digits, if emergency call.
EMS-Key	O_C	O_C	The emergency service routing key, if emergency call.
LCS QoS	C	C	QoS of the LR, if available.
LCS Priority	C	C	Priority of the LR, if available.

Field	2G	3G	Description
MLC Number	C	C	The E.164 address of the involved GMLC, if available.
Event Time Stamp	M	M	The time at which the LR was received by the MSC.
MeasureDuration	O_M	O_M	The duration of proceeding the location request .
Location Estimate	O_C	O_C	The location estimate for the subscriber if contained in geographic position and the LR was successful.
Positioning Data	C	C	The positioning method used or attempted, if available.
LCS Cause	C	C	The result of the LR if any failure or partial success happened.
Diagnostics	C	C	A more detailed infromation about the LCS cause if any failure or partial success happened.
System Type	-	M	This field indicates the use of GERAN or UTRAN at the time of the LCS request. This field is present when either the UTRAN or GERAN air-interface is used on call setup.
Record extensions	O_C	O_C	A set of network/ manufacturer specific extensions to the record.

5 Description of Record Fields

This clause contains a brief description of each field of the CDRs described in the previous clause.

5.18 Diagnostics

This field includes a more detailed technical reason for the release of the connection and may contain one of the following:

- a MAP error from TS 29.002 [5];
- a Cause from TS 24.008 [4];
- a Cause from TS 29.078 [13];
- a Cause from ITU-T Recommendation Q.767 [14] ;
- a LCS diagnostics according TS 29.002 [5]..

The diagnostics may also be extended to include manufacturer and network specific information.

5.19 EMS-Digits

This parameter only applies to location for an emergency services call in North America and gives the North American Emergency Services Routing Digits.as defined in TS 29.002 [5].

5.20 EMS-Key

This parameter only applies to location for an emergency services call in North America and gives the North American Emergency Services Routing Key as defined in TS 29.002 [5].

5.242 Event time stamps

These fields contain the event time stamps relevant for each of the individual record types.

The call records may contain three significant call handling time stamps:

- The time at which the resource in question was seized (Seizure time).
- The time at which the call was answered or at which charging commences (Answer time).
- The time at which the resource was released (Release time).

For both Mobile Originated and Mobile Terminated calls, the Seizure time is the time at which the traffic channel is allocated i.e. the time at which the ASSIGN COMMAND message is sent to the MS.

For Mobile Originated calls the Answer time is the time at which the CONNECT message is sent to the calling party. For Mobile Terminated calls the time at which the CONNECT message is received from the called party. However, if the subscriber has subscribed to the advice of charge charging level service, then the answer time shall be derived from the time at which the FACILITY message is received from the MS containing the acknowledgement of receipt of the AOC parameters. Similarly, if the AOC parameters are changed during the call then the change time recorded for a subscriber with AOC charging level is the receipt of the FACILITY message from the MS. For a subscriber with AOC information level the change time recorded is the time at which the FACILITY is sent to the MS. Finally, in case of call re-establishment the answer time is the time at which the new traffic channel is allocated by the MSC i.e. when the ASSIGN COMMAND is sent to the MS.

The Release time is the time at which the connection is released by either party i.e. a DISCONNECT or RELEASE is sent by the network or a DISCONNECT is received from the MS. In the case of a radio link failure, the release time is the time at which the failure was detected by the MSC.

For unsuccessful call attempts the Seizure time is mandatory. The Release time is optional and the call duration recorded is the call holding time i.e. the difference between the two.

For successful calls the Answer time is mandatory and both the Seizure and Release times are optional. The call duration recorded is the chargeable duration i.e. the difference between the Answer and Release time stamps.

The event records include the following time stamps:

- HLR-int time: The receipt of a MAP_SEND_ROUTING_INFO request by the HLR.
- Loc.Upd. time: The receipt of a MAP_UPDATE_LOCATION_AREA request by the VLR or the receipt of a MAP_UPDATE_LOCATION request by the HLR.
- SS-Action: The receipt of a supplementary service request by the VLR.

  e.g. MAP_REGISTER_SS, MAP_INVOKE_SS
- SMS-MO: The receipt of an RP_DATA message from the MS containing an SMS_SUBMIT PDU.
- SMS-MT: The transmission of an RP_DATA message to the MS containing an SMS_DELIVER PDU.
- LCS: The time the LR was processed.

It should be noted that the events listed above are only examples in order to demonstrate the principles and that the list is by no means exhaustive.

All time-stamps include a minimum of date, hour, minute and second.

5.34 LCS Cause

The LCS Cause parameter provides the reason for an unsuccessful location request according TS 49.031 [31].

5.35 LCS Client Identity

This field contains further information on the LCS Client identity:

- Client External ID
- Client Dialled by MS ID
- Client Internal ID

5.36 LCS Client Type

This field contains the type of the LCS Client as defined in TS 29.002 [5]

5.37 LCS Priority

This parameter gives the priority of the location request as defined in TS 49.031 [31]

5.38 LCS QoS

This information element defines the Quality of Service for a location request as defined in TS 49.031 [31]

5.41 Location Estimate

The Location Estimate field is providing an estimate of a geographic location of a target MS according to 3GPP TS 29.002 [5].

5.42 Location Type

This field contains the type of the location as defined in TS 29.002 [5]

5.43 Measure Duration

This field contains the duration for the section of the location measurement corresponding to the location request and the location report messages.

5.45 MLC Number

This parameter refers to the ISDN (E.164) number of an MLC.

5.47 MOLR Type

The MOLR-Type identifier refers to the type of MO-LR that was invoked as defined in 24.080 [32]

5.51 Notification to MS user

This field contains the privacy notification to MS user that was applicable when the LR was invoked as defined in TS 29.002 [5]

5.55 Positioning Data

This information element is providing positioning data associated with a successful or unsuccessful location attempt for a target MS according TS 49.031 [31].

5.56 Privacy Override

This parameter indicates if MS privacy is overridden by the LCS client when the GMLC and VMSC/SGSN for an MT-LR are in the same country as defined in TS 29.002 [5]

6 Charging Data Record Structure

6.1 ASN.1 definitions for CDR information

Within the current 3GPP TS 32-series of specifications the ASN.1 definitions are based on ITU-T Recommendation X.208 [8] which has been superseded by ITU-T Recommendation X.680. This newer version not only includes new features but also removes some that were present in ITU-T Recommendation X.208. It was agreed that where possible, the GPRS work would be based on those ASN.1 features that were common to both. However, where necessary, the new features in ITU-T Recommendation X.680 [7] be used in some places. ITU-T Recommendation X.208 [8] feature that are no longer in ITU-T Recommendation X.680 [7] will not be used.

```
TS32205-DataTypes {itu-t (0) identified-organization (4) etsi(0) mobileDomain (0) umts-Operation-
Maintenance (3) ts-32-205 (205) informationModel (0) asn1Module (2) version1 (1)}


DEFINITIONS IMPLICIT TAGS   ::=

BEGIN

-- EXPORTS everything

IMPORTS

NumberOfForwarding, CallReferenceNumber
FROM MAP-CH-DataTypes { ccitt identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1)
modules (3) map-CH-DataTypes (13) version6 (6) }

AddressString, ISDN-AddressString, BasicServiceCode, IMSI, IMEI, LCSClientExternalID,
LCSClientInternalID
FROM MAP-CommonDataTypes { ccitt identified-organization (4) etsi (0) mobileDomain (0) gsm-Network
(1) modules (3) map-CommonDataTypes (18) version6 (6) }

DestinationRoutingAddress
FROM CAP-DataTypes { ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) cap-datatypes (52) version1 (0) }

ServiceKey, DefaultCallHandling, DefaultSMS-Handling, NotificationToMSUser
FROM MAP-MS-DataTypes { ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) map-MS-DataTypes (11) version6 (6) }


MOLR-Type
FROM SS-DataTypes { ccitt identified-organization (4) etsi (0) mobileDomain (0) gsm-Access (2)
modules (3) ss-DataTypes (2) version7 (7)}

BearerServiceCode
FROM MAP-BS-Code { ccitt identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1)
modules (3) map-BS-Code (20) version6 (6) }

TeleserviceCode
FROM MAP-TS-Code { ccitt identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1)
modules (3) map-TS-Code (19) version2 (2) }

SS-Code
FROM MAP-SS-Code { ccitt identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1)
modules (3) map-SS-Code (15) version6 (6) }

Ext-GeographicalInformation, LCSClientType, LCS-Priority, LocationType
FROM MAP-LCS-DataTypes { ccitt identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1)
modules (3) map-LCS-DataTypes (25) version7 (7)}

PositionMethodFailure-Diagnostic
FROM MAP-ER-DataTypes { ccitt identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1)
modules (3) map-ER-DataTypes (17) version7 (7)}

BasicService
FROM Basic-Service-Elements { ccitt identified-organization (4) etsi (0)
196 basic-service-elements (8) }
--
-- See "Digital Subscriber Signalling System No. one (DSS1) protocol"
-- ETS 300 196
--
```

```
ObjectInstance
FROM CMIP-1 {joint-iso-ccitt ms (9) cmip (1) version1 (1) protocol (3)}

ManagementExtension
FROM Attribute-ASN1Module {joint-iso-ccitt ms (9) smi (3) part2 (2) asn1Module (2) 1}

SystemType
FROM TS32215-DataTypes {itu-t (0) identified-organization (4) etsi (0) mobileDomain (0) umts-
Operation-Maintenance (3) ts-32-215 (215) informationModel (0) asn1Module (2) version1 (1)}

SGSNPDPRecord, GGSNPDPRecord, SGSNMMRecord, SGSNSMORecord, SGSNSMTRecord, SGSNMTLCSRecord
FROM TS32215-DataTypes {itu-t (0) identified-organization (4) etsi (0) mobileDomain (0) umts-
Operation-Maintenance (3) ts-32-215 (215) informationModel (0) asn1Module (2) version1 (1)}

MMSORecord, MMSTRecord
FROM TS32235-DataTypes {itu-t (0) identified-organization (4) etsi (0) mobileDomain (0) umts-
Operation-Maintenance (3) ts-32-235 (235) informationModel (0) asn1Module (2) version1 (1)}

AE-title
FROM ACSE-1 {joint-iso-ccitt association-control (2) abstract-syntax (1) apdus (0) version (1) };
--
-- Note that the syntax of AE-title to be used is from
-- CCITT Rec. X.227 / ISO 8650 corrigendum and not "ANY"
--------------------------------------------------------------------------------
--
--  CALL AND EVENT RECORDS
--
--------------------------------------------------------------------------------

CallEventRecord ::= CHOICE
--
-- Record values 0..169 are 3G curcuit switch specific
--               20..254 are 3G packet switch specific
--               30..31 are application specific
--
{
    moCallRecord            [0] MOCallRecord,
    mtCallRecord            [1] MTCallRecord,
    roamingRecord           [2] RoamingRecord,
    incGatewayRecord        [3] IncGatewayRecord,
    outGatewayRecord        [4] OutGatewayRecord,
    transitRecord           [5] TransitCallRecord,
    moSMSRecord             [6] MOSMSRecord,
    mtSMSRecord             [7] MTSMSRecord,
    moSMSIWRecord           [8] MOSMSIWRecord,
    mtSMSGWRecord           [9] MTSMSGWRecord,
    ssActionRecord          [10] SSActionRecord,
    hlrIntRecord            [11] HLRIntRecord,
    locUpdateHLRRecord      [12] LocUpdateHLRRecord,
    locUpdateVLRRecord      [13] LocUpdateVLRRecord,
    commonEquipRecord       [14] CommonEquipRecord,
    recTypeExtensions       [15] ManagementExtensions,
    termCAMELRecord         [16] TermCAMELRecord,
    mtLCSRecord             [17] MTLCSRecord,
    moLCSRecord             [18] MOLCSRecord,
    niLCSRecord             [19] NILCSRecord,

    sgsnPDPRecord           [20] SGSNPDPRecord,
    ggsnPDPRecord           [21] GGSNPDPRecord,
    sgsnMMRecord            [22] SGSNMMRecord,
    sgsnSMORecord           [23] SGSNSMORecord,
    sgsnSMTRecord           [24] SGSNSMTRecord,
    sgsnLCTRecord           [25] SGSNLCTRecord,

    mmsORecord              [30] MMSORecord,
    mmsTRecord              [31] MMSTRecord
}
...
```

< unmodified ASN.1 >

```
…

MTLCSRecord             ::= SET
{
    recordType              [0] CallEventRecordType,
    recordingEntity         [1] RecordingEntity,
```

```
    lcsClientType           [2] LCSClientType,
    lcsClientIdentity       [3] LCSClientIdentity,
    servedIMSI              [4] IMSI,
    servedMSISDN            [5] MSISDN OPTIONAL,
    locationType            [6] LocationType,
    lcsQos                  [7] LCSQoSInfo OPTIONAL,
    lcsPriority             [8] LCS-Priority OPTIONAL,
    mlc-Number              [9] ISDN-AddressString,
    eventTimeStamp          [10] TimeStamp,
    measureDuration         [11] CallDuration OPTIONAL,
    notificationToMSUser    [12] NotificationToMSUser OPTIONAL,
    privacyOverride         [13] NULL OPTIONAL,
    location                [14] LocationAreaAndCell OPTIONAL,
    locationEstimate        [15] Ext-GeographicalInformation OPTIONAL,
    positioningData         [16] PositioningData OPTIONAL,
    lcsCause                [17] LCSCause OPTIONAL,
    diagnostics             [18] Diagnostics OPTIONAL,
    systemType              [19] SystemType OPTIONAL,
    recordExtensions        [20] ManagementExtensions OPTIONAL
}

MOLCSRecord             ::= SET
{
    recordType              [0] CallEventRecordType,
    recordingEntity         [1] RecordingEntity,
    lcsClientType           [2] LCSClientType OPTIONAL,
    lcsClientIdentity       [3] LCSClientIdentity OPTIONAL,
    servedIMSI              [4] IMSI,
    servedMSISDN            [5] MSISDN OPTIONAL,
    molr-Type               [6] MOLR-Type,
    lcsQos                  [7] LCSQoSInfo OPTIONAL,
    lcsPriority             [8] LCS-Priority OPTIONAL,
    mlc-Number              [9] ISDN-AddressString OPTIONAL,
    eventTimeStamp          [10] TimeStamp,
    measureDuration         [11] CallDuration OPTIONAL,
    location                [12] LocationAreaAndCell OPTIONAL,
    locationEstimate        [13] Ext-GeographicalInformation OPTIONAL,
    positioningData         [14] PositioningData OPTIONAL,
    lcsCause                [15] LCSCause OPTIONAL,
    diagnostics             [16] Diagnostics OPTIONAL,
    systemType              [17] SystemType OPTIONAL,
    recordExtensions        [18] ManagementExtensions OPTIONAL
}

NILCSRecord             ::= SET
{
    recordType              [0] CallEventRecordType,
    recordingEntity         [1] RecordingEntity,
    lcsClientType           [2] LCSClientType OPTIONAL,
    lcsClientIdentity       [3] LCSClientIdentity OPTIONAL,
    servedIMSI              [4] IMSI OPTIONAL,
    servedMSISDN            [5] MSISDN OPTIONAL,
    servedIMEI              [6] IMEI OPTIONAL,
    emsDigits               [7] ISDN-AddressString OPTIONAL,
    emsKey                  [8] ISDN-AddressString OPTIONAL,
    lcsQos                  [9] LCSQoSInfo OPTIONAL,
    lcsPriority             [10] LCS-Priority OPTIONAL,
    mlc-Number              [11] ISDN-AddressString OPTIONAL,
    eventTimeStamp          [12] TimeStamp,
    measureDuration         [13] CallDuration OPTIONAL,
    location                [14] LocationAreaAndCell OPTIONAL,
    locationEstimate        [15] Ext-GeographicalInformation OPTIONAL,
    positioningData         [16] PositioningData OPTIONAL,
    lcsCause                [17] LCSCause OPTIONAL,
    diagnostics             [18] Diagnostics OPTIONAL,
    systemType              [19] SystemType OPTIONAL,
    recordExtensions        [20] ManagementExtensions OPTIONAL
}
```

…

< unmodified ASN.1 >

…

```
--------------------------------------------------------------------------------
--
--  COMMON DATA TYPES
```

```
--
-------------------------------------------------------------------------------
…
```

< unmodified ASN.1 >

```
…
CallEventRecordType     ::= INTEGER
{
    moCallRecord        (0),
    mtCallRecord        (1),
    roamingRecord       (2),
    incGatewayRecord    (3),
    outGatewayRecord    (4),
    transitCallRecord   (5),
    moSMSRecord         (6),
    mtSMSRecord         (7),
    moSMSIWRecord       (8),
    mtSMSGWRecord       (9),
    ssActionRecord      (10),
    hlrIntRecord        (11),
    locUpdateHLRRecord  (12),
    locUpdateVLRRecord  (13),
    commonEquipRecord   (14),
    moTraceRecord       (15),
    mtTraceRecord       (16),
    termCAMELRecord (17),
--
--  Record values 18..22 are GPRS specific.
--  The contents are defined in TS 32.015
--
    sgsnPDPRecord       (18),
    ggsnPDPRecord       (19),
    sgsnMMRecord        (20),
    sgsnSMORecord       (21),
    sgsnSMTRecord       (22),

--
--  Record values 23..24 are MMS specific.
--  The contents are defined in TS 32.235
--
    mmsORecord          (23),
    mmsTRecord          (24),

--
--  Record values 25..28 are LCS specific.
--  The contents are defined in this specification 32.205
--
    mtLCSRecord         (25),
    moLCSRecord         (26),
    niLCSRecord         (27),
    sgsnMtLCSRecord     (28)


…
```

< unmodified ASN.1 >

```
…
Diagnostics                     ::= CHOICE
{
    gsm0408Cause                [0] INTEGER,
    -- See TS 24.008
    gsm0902MapErrorValue        [1] INTEGER,
    -- Note: The value to be stored here corresponds to
    -- the local values defined in the MAP-Errors and
    -- MAP-DialogueInformation modules, for full details
    -- see TS 29.002.
    ccittQ767Cause              [2] INTEGER,
    -- See CCITT Q.767
    networkSpecificCause        [3] ManagementExtension,
    -- To be defined by network operator
    manufacturerSpecificCause   [4] ManagementExtension,
    -- To be defined by manufacturer
    lcsCauseDiagnostics         [5] PositionMethodFailure-Diagnostic
    -- see TS 29.002
}
```

…

< unmodified ASN.1 >

…

```
LCSCause                ::= OCTET STRING (SIZE(1))
    --
    -- See LCS Cause Value, 3GPP TS 49.031
    --

LCSClientIdentity       ::= SEQUENCE
{
    lcsClientExternalID [0] LCSClientExternalID OPTIONAL,
    lcsClientDialedByMS [1] AddressString OPTIONAL,
    lcsClientInternalID [2] LCSClientInternalID OPTIONAL
}

LCSQoSInfo              ::= OCTET STRING (SIZE(4))
    --
    -- See LCS QoS IE, 3GPP TS 49.031
    --
```

…

< unmodified ASN.1 >

…

```
PositioningData ::= OCTET STRING (SIZE(1..33))
    --
    -- See Positioning Data IE (octet 3..n), 3GPP TS 49.031
    --
```

…

< unmodified ASN.1 >

…

```
END
```