

Handläggande organ/Standardizing body	Fastställt/Approved	Utgåva/Edition	Sida/Page
ITS Information Technology Standardization	2004-04-01	1	1 (23)

Positioning of Mobile Terminals at Emergency Calls

A Swedish National Standard for procedures and interfaces for the support of positioning of mobile terminals at Emergency Calls

ICS 33.040.30

Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.
Postadress: SIS., 118 80 STOCKHOLM
Telefon: 08-555 523 10.
E-post: sis.sales@sis.se. Internet: www.sis.se

Upplysningar om **sakinnehållet** i standarden lämnas av ITS.
Telefon: 08-444 14 24. Telefax: 08-444 14 30
E-post: info@its.se

Prisgrupp N

Contents

1	INTRODUCTION	3
2	SCOPE	3
3	NORMATIVE REFERENCES.....	4
4	TERMS AND DEFINITIONS	5
4.1	EMERGENCY CALL.....	5
4.2	EMERGENCY OPERATOR	5
4.3	EMERGENCY SERVICES OPERATOR.....	5
4.4	GLOBAL TITLE (GT).....	5
4.5	LOCATION PROCEDURE OR POSITIONING	5
4.6	MOBILE LOCATION PROTOCOL (MLP).....	5
4.7	MSISDN	5
4.8	ORIGINATING PLMN	6
4.9	POSITION	6
4.10	PUBLIC SERVICE ANSWERING POINT, (PSAP)	6
4.11	TRANSIT OPERATOR NETWORK (CARRIER NETWORK).....	6
5	SYMBOLS AND ABBREVIATIONS.....	6
6	SYSTEM OVERVIEW	6
7	METHODS AND PROCEDURES FOR LOCATION OF MOBILE TERMINALS FOR EMERGENCY SERVICES	7
7.1	GENERAL	7
7.2	GENERAL PROCEDURE	7
7.3	INFORMATION SENT IN INITIAL ADDRESS MESSAGE OF ISUP.....	8
7.4	INFORMATION SENT IN MOBILE LOCATION PROTOCOL	11
7.5	TRANSFER OF INFORMATION RECEIVED IN THE EMERGENCY CALL.....	11
8	MLP IMPLEMENTATION FOR EMERGENCY LOCATION INFORMATION INTERFACE IN SWEDEN.....	13
8.1	NOTICE OF COPYRIGHT	13
8.2	GLOSSARY AND TERMS IN THIS CHAPTER	13
8.3	SCOPE OF THIS CHAPTER	14
8.4	LIF TS 101 v3.0.0 ENDORSEMENT.....	14
	ANNEX A	20

1 Introduction

This standard is released to describe the interfaces and procedures between public communications networks and the Emergency Services Operator for the support of positioning of mobile terminals at Emergency Calls, with an enhanced and exclusive positioning method. The standard describes the Swedish implementation of location at Emergency Calls according to European Commission Directive 2002/22/EC.

The standard describes procedures, interfaces and information elements to be used in the transfer of information in Emergency Calls from digital public land mobile networks to the Emergency Services Operator. It also describes the procedures and interfaces to be used for the support of the location request procedure between the Emergency Services Operator and digital public land mobile network operators.

The document describes technical issues. It is assumed that the public communications operators concerned and the Emergency Services Operator sign mutual commercial agreements on interconnection, traffic cases, routing, services, traffic volumes, accounting procedures, information integrity, prices, etc.

2 Scope

The objective of the Emergency Call location service is to enable retrieval of the position of a digital mobile terminal making an Emergency Call, irrespective of the subscriber's status in the Home Location Register, (HLR).

To facilitate fulfilment of the stated objective, some additional information has to be conveyed from the originating mobile network to the Emergency Services Operator. The Emergency Services Operator will be able to perform an emergency location request, with help of the received information. This standard is produced in order to control the format of information sent from the PLMNs with the Emergency Call and also the interface and procedures to be used for the emergency location request.

This Swedish Standard,

- Describes the general procedure for positioning of a digital mobile terminal making an Emergency Call in Sweden,
- Describes the ISUP parameter Location Number to be used at Emergency Calls from a digital PLMN to the Emergency Services Operator;
- Describes the Mobile Location Protocol, MLP to be used for emergency location request by the Emergency Services Operator,
- Describes the mapping of information elements between ISUP and MLP,
- Is based on White Book-level ISUP implementation between the public communications networks and the Emergency Services Operator,
- Is applicable for national interconnect ISUP specifications between public communications networks in Sweden that are Telia's specifications 8211-A335 rev C; and 8211-A325 rev C and Swedish Standard SS636393, 2000, release 1.

The procedures that can be used inside a PLMN are described in the following Application Guide.

- Report ITS 19 – Procedures in PLMN for positioning of mobile terminals at Emergency Calls

3 Normative references

The following normative documents contain provisions, which through reference in this text constitute provisions of this standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below.

2003/558/EG	KOMMISSIONENS REKOMMENDATION av den 25 juli 2003 om behandling av lokaliseringssuppgifter i elektroniska kommunikationsnät vid tillhandahållande av nödsamtalstjänster som byggts ut med samtalslokalisering.
3GPP TS 23.271 v6.2.0 (2002-12)	Functional Stage 2 description of LCS (Release 6)
CGALIES final report (2002-02-18)	Report on implementation issues related to access to location information by emergency services (E112) in the European Union
ETSI SR 002 180 (2003-03)	Requirements for communication of citizens with authorities/organisations in case of distress (emergency call handling)
European Commission Directive 2002/22/EC	The Universal Service Directive, Article 26 § 3
HTTP/1.1	Hypertext Transfer Protocol RFC 2068, June 1999
ITU-T Rec. E.164 (05/97)	The international public telecommunication numbering plan
ITU-T Rec. Q.763 (12/1999)	Format and codes of the ISDN user part of signalling system No. 7
ITU-T Rec. Q.767 (1991)	Application of the ISDN user part of CCITT signalling system No. 7 for international ISDN interconnection
LIF TS 101(V3.0.0)	Mobile Location Protocol
Post & Telestyrelsen http://www.pts.se/	Compilation of structures and principles regarding the Swedish numbering plan
Oftel PNO-ISC/SPEC/013	Emergency Location Information Interface
PTSFS 2001:11 2001-11-16 In Swedish only	Post- och telestyrelsens föreskrifter om teleoperatörs skyldighet att för nummerupplysningsändamål lämna ut uppgift om enskildas teleabonnemang
PTSFS 2002:4 2002-05-16 In Swedish only	Post- och telestyrelsens föreskrifter om förmedling av nödsamtal till samhällets alarmerings- och räddningstjänst
SOS Alarm AB (http://194.14.58.13/)	Riktlinjer för Nödtrafik, 112 i Sverige, Kommun id plan.doc (in Swedish only)
SS636393, 2000. release 1	PSTN/ISDN – PLMN(GSM)/ISDN signalling interface for Sweden

Telia 1/8211-A325 Rev A	Annex 1 (8211-A325)
Telia 1/8211-A335 Rev A	Annex 1 (8211-A335)
Telia 8211-A325 Rev A	ISDN-PLMN (GSM) signalling interface for Sweden
Telia 8211-A335 Rev C	ISDN-ISDN signalling interface for Sweden
Telia ISUP (1999-08-04)	Requirement Specification for ISUP in Telia Network1056-A629 PF1
ETSI-TS 101 109 (V7.1.0)	Digital cellular telecommunications systems (Phase 2+) (GSM); Universal Geographical Area Description (GAD); (GSM 03.32 version 7.1.0 Release 1998)
ETSI-TS 101 724 (V8.6.0)	Digital cellular telecommunications systems (Phase 2+) (GSM); Location Services (LCS); (Functional description) – Stage 2 (GSM 03.71 version 7.4.0 Release 1998)
www.epsg.org #4326	European Petroleum Survey Group Geodesy Parameters
XML 1.0	Extensible Mark-up LanguageW3C Recommendation REC-xml-19980210

4 Terms and definitions

4.1 Emergency Call

A call made to the Emergency Services. In Sweden the emergency numbers that can be used are 112 or 90 000 according to "The Swedish numbering plan for telephony according to ITU-T recommendation E.164, appendix 2b".

4.2 Emergency Operator

The person receiving an Emergency Call at a Public Service Answering Point.

4.3 Emergency Services Operator

The PSAP operator providing access to the public communications network for support of incoming Emergency Calls. In Sweden today the PSAP operator is SOS Alarm.

4.4 Global Title (GT)

A unique address set and used of SCCP of Signalling System number 7. This specific address can be used to globally address (identify) each SCCP-node. The GT-address can also be used to implicitly identify the network that the GT belongs to, as addresses are nationally and internationally coordinated.

4.5 Location Procedure or Positioning

The procedure of finding the position of a mobile terminal

4.6 Mobile Location Protocol (MLP)

A protocol used between a location server and a location client for support of the location request and response procedure.

4.7 MSISDN

Mobile Station International ISDN Number. The format of the MSISDN is Country Code + National Destination Code + Subscriber Number, CC+NDC+SN.

4.8 Originating PLMN

The mobile network where the Emergency Call was originated.

4.9 Position

The successful result of a location procedure (also called positioning).

4.10 Public Service Answering Point, (PSAP)

The call centre connected to the public communications network receiving Emergency Calls. (In Sweden called "Larmcentral", abbreviated LAC.)

4.11 Transit Network (Carrier Network)

A network between the Originating PLMN and the Emergency Services Operator.

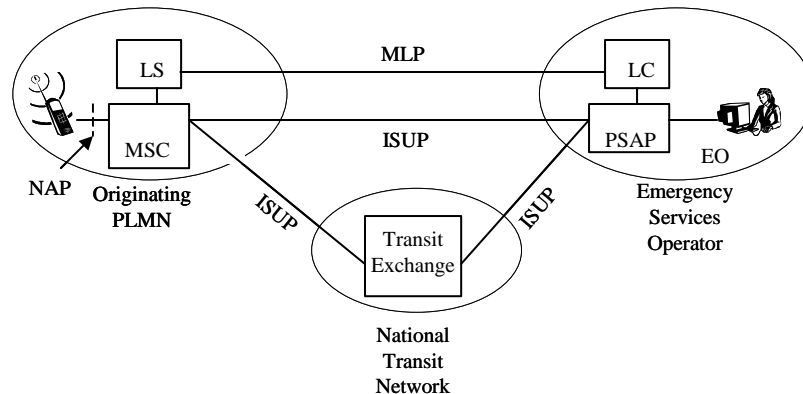
5 Symbols and abbreviations

GMLC	Gateway Mobile Location Centre
GT	Global Title of SCCP, using E.214 numbering plan
HLR	Home Location Register
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
Le	Le Interface: interface between the GMLC and LCS clients
LCS	Location Services
LIF	Location Interoperability Forum ¹
MLP	Mobile Location Protocol, according to LIF TS 101
MSC	Mobile Switching Centre
NAP	Network Access Point. The NAP is the Network Termination Point (NTP) in mobile communications networks
PLMN	Public Land Mobile Network
POI	Point of Interconnection
PSAP	Public Service Answering Point
SCCP	Signalling Connection Control Part of SS7, according to ITU-T Q.711-Q.716.
SIM	Subscriber Identification Module: Used for 2G terminals
SS7	Common Channel Signalling system number 7, according to ITU-T Q.700 series
USIM	UMTS Subscriber Identification Module: Used for 3G terminals

6 System overview

In Sweden public land mobile networks might be connected directly to the Emergency Services Operator or indirectly through a National Transit Network. In both cases the interconnection protocol is ISUP. See Picture 1.

¹ The working group having replaced LIF is OMA, Open Mobile Alliance, see www.openmobilealliance.org.



Picture 1

The support of positioning of mobile terminals for Emergency Calls requires a new interface between the Emergency Services Operator and digital public land mobile network operators. This IP-based interface is used to carry Mobile Location Protocol, MLP as illustrated in Picture 1. The security arrangements for this IP interface are agreed mutually between the PLMN operator and the Emergency Service Operator.

7 Methods and procedures for location of mobile terminals for emergency services

7.1 General

Additionally to the standardised positioning method, two methods of implementing the exclusive emergency location requests of mobile terminals making Emergency Calls have been defined in Sweden. Both methods rely on use of MSC-identity. For detailed descriptions of the two alternative procedures² see Application Guide ITS 19: "Procedures in digital PLMN for positioning of Mobile Terminals at Emergency Calls."

Location of mobile terminals requires information to be sent from the mobile network where the call was originated to the Emergency Services Operator for performing the query for location. The choice of method to be used by a Mobile Network Operator does not impact the systems of the Emergency Services Operator i.e. the information sent to the Emergency Services Operator for the location request passes transparently and is used by the sending Mobile Network Operators systems for determining the position of the caller.

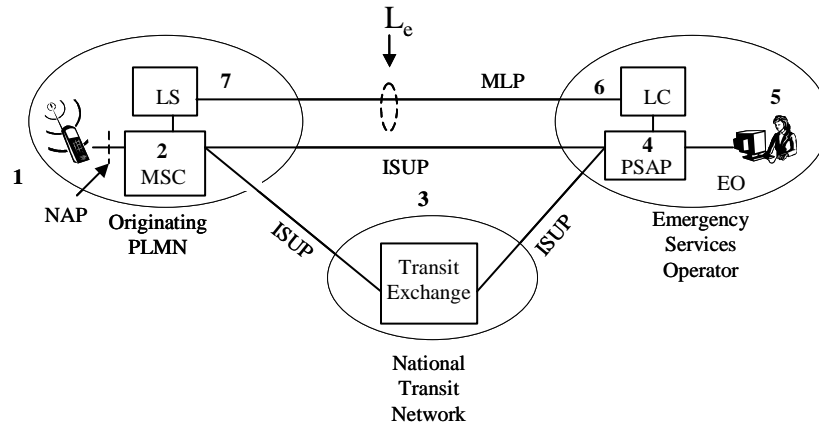
7.2 General procedure

The general procedure for exclusive emergency location of mobile terminals making Emergency Calls is described below, see Picture 2.

1. A mobile terminal makes an Emergency Call.
2. The call is switched by the originating MSC.
3. The call might be routed through a National Transit Network using ISUP.
4. The call reaches the Public Service Answering Point, PSAP.

² The two procedures are called "A-number based location request" and "Cell-ID based location request".

5. The Emergency Operator answering the call decides to get the position of the calling terminal.
6. A location request is sent from the location client to the location server in the mobile network.
7. The mobile network answers by sending the location of the mobile terminal to the location client.



Picture 2

7.3 Information sent in Initial Address Message of ISUP

7.3.1 Calling Party's Number

Shall always be present when the MSISDN is available at originating MSC.

Coding of the parameter shall be according to ITU-T Q.763.

7.3.2 Location Number

The purpose of using the parameter Location Number is to enable identification of originating PLMN and MSC (for A-number based location request) or originating PLMN and Cell-identity (for Cell-ID based location request). To achieve this, the structure used for Mobile Global Title as described in E.214 is utilized.

The Mobile Global Title address information is conveyed in ISUP in the parameter Location Number. The coding described below is to be applied for Emergency Calls from digital Public Land Mobile Networks, see Table 1.

	8	7	6	5	4	3	2	1
1	O/E		Nature of address indicator					
2	INN		Numbering plan indicator		Address presentation restricted indicator		Screening indicator	
3	2nd address signal				1st address signal			
::								

m	Filler (if necessary)	nth address signal
---	-----------------------	--------------------

Table 1

Maximum length of parameter is 10 octets according to ITU-T Q.763.

The following codes are used in the sub-fields of the location number parameter field:

- a) Odd/even indicator
 - 0 Even number of address signals
 - 1 Odd number of address signals
- b) Nature of address indicator
 - 0 0 0 0 1 0 0 International number
- c) Internal Network Number indicator (INN)
 - 0 Routing to internal number not allowed
- d) Numbering Plan indicator
 - 0 0 1 ISDN (telephony) numbering plan (ITU-T recommendation E.164)
- e) Address presentation restricted indicator
 - 0 1 Presentation restricted
- f) Screening indicator
 - 1 1 Network provided
- g) Address signals

To be coded in accordance with the E.214 (MGT) Address Plan allocated to the originating operator.

Digits 1 to N: First N digits of Mobile Global Title according to E.214 allocation.

Example 1: Digits 1 to N for A-number based location request

A string “46705000111” is generated for a call initiated in TeliaSonera Sweden mobile network. The first six digits, 467050, belong to the address-series that is allocated to TeliaSonera Sweden Mobile, i.e. it implies TSS Mobile is the originating PLMN operator.

Example 2: Digits 1 to N for Cell-ID based location request

A string “467075620173281” is generated for a call initiated in Tele2 mobile network. The first five digits, 46707, belong to the address-series that is allocated to Tele2 mobile network, i.e. it implies Tele2 is the originating PLMN operator.

Digits (N+1) to 16: Used for support of location method chosen by network operator

Example 3: Digits (N+1) to 16 for A-number based location request

A string “46705000111” is generated for a call initiated in TeliaSonera Sweden mobile network. The last five digits, 00111, is a network internal unique identification of the MSC in TeliaSonera Sweden mobile network where the emergency call was originated.

Example 4: Digits (N+1) to 16 for Cell-ID based location request

A string “467075620173281” is generated for a call initiated in Tele2 mobile network. The last ten digits, 5620173281³, is a network internal unique identification of the location area and cell in Tele2 mobile network where the emergency call was originated.

All digital PLMN operators must inform the Emergency Services Operator what unique address series will be used for identifying the originating PLMN, i.e. digits 1 to N.

The length of the first part, i.e. digits 1 to N, is variable and depending on the allocation given to the PLMN in the Swedish Numbering Plan. The number of digits used, N, must be sufficient for a unique identification of the PLMN.

Digits (N+1) to 16 are sent transparently through the Emergency Services Operator and allocation and interpretation is a network internal issue for the sending PLMN.

h) Filler

In case of an odd number of address signals, the filler code 0000 is inserted after the last address signal.

7.3.3 Parameter Compatibility Information

The setting of the Parameter Compatibility Information parameter for the Location Number shall be coded as follows.

Bit A	<i>Transit at intermediate exchange indicator</i>
0	Transit interpretation
Bit B	<i>Release call indicator</i>
0	Do not release call
Bit C	<i>Send notification indicator</i>
0	Do not send notification
Bit D	<i>Discard message indicator</i>
0	Do not discard message (pass on)
Bit E	<i>Discard parameter indicator</i>
0	Do not discard parameter (pass on)
Bit G F	<i>Pass on not possible indicator</i>
1 0	Discard parameter

³ String 56201 is LAC (Location Area Code), string 73281 is Cell-ID.

Bit ext *Extension indicator*
 1 Last octet

7.4 Information sent in Mobile Location Protocol

If the emergency operator at the PSAP decides to invoke a location request after having received an Emergency Call from a digital PLMN, the Emergency Location Immediate Service defined in Mobile Location Protocol is used. The version of the MLP implementation for Location Enhanced 112 services in Sweden is specified in LIF TS 101 V3.0.0.

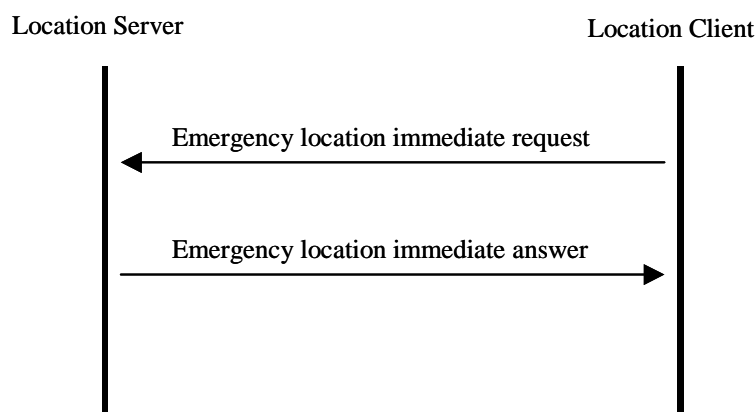
7.4.1 Emergency Location Immediate Service

The Emergency Location Immediate Service is used to retrieve the position of a mobile subscriber that is involved in an Emergency Call or have initiated an emergency service in some other way.

The service consists of the following messages.

- Emergency Location Immediate Request
- Emergency Location Immediate Answer

The message flow describing the service is shown in Picture 3.



Picture 3

The key element in the request is the identity of the mobile subscriber, MSISDN that will be used as identifier. Visited MSC will also be transferred in the Swedish implementation to simplify position of roaming subscribers.

The key element in the answer is the mobile subscribers position. The position will be transferred as a geographical shape rather than just a point.

A detailed description of the MLP implementation can be found in chapter 8.

Examples of MLP-messages are given in Annex A.

7.5 Transfer of information received in the Emergency Call

The information received in the incoming call should be mapped to the corresponding parameters in Mobile Location Protocol, see Table 2.

Parameter in ISUP	Element in MLP
Calling Party Number - A subscribers MSISDN present.	msisdn

if available	
Location Number - Mobile Global Title of MSC, or for the Cell-ID method, a string using similar format	vmscno

Table 2**7.5.1 Comments on availability of Calling Party Number**

Calling Party Number should always be sent. For the positioning call cases where Calling Party Number is not available any other identification agreed by the industry should be sent.

7.5.2 Comments on use of Global Title

The first part of the Global Title identifying the originating network is used by the Emergency Services Operator for deciding which network to send the location request to.

The remaining digits of the Global Title string, are used by the originating PLMN for support of the location method used, see Application Guide ITS 19. These digits are not interpreted by the systems of the Emergency Services Operator.

The complete Global Title as received is sent further in the location request in MLP.

7.5.3 Positioning Call Cases

The following call cases for positioning of mobile terminals shall be supported, see Table 3.

	Emergency call setup-case	Comment	Identifier of the mobile subscriber
1	Terminal with a valid SIM/USIM in the home network	Note 1.	Subscribers MSISDN
2 a	Terminal with a valid SIM/USIM in another, visited national network	National roaming. Note 1.	Subscribers MSISDN
2 b	Terminal with a valid non-Swedish SIM/USIM in the visited network	International (inbound) roaming. Note 1.	Subscribers MSISDN
3	Terminal without a valid/recognised SIM/USIM	- No radio coverage by the subscribers operator, but instead by another Swedish operator (without national roaming agreement) - International inbound roaming attempt, agreement missing - SIM/USIM -card not activated - No PIN code authentication	Subscribers positioning not supported. Location of the mobile terminal based on the serving cell might work.

		performed - Any other conditions when the IMSI from SIM/USIM will be unrecognised to the network. - Prepaid subscriber with an empty balance. Note 2	
4	Terminal without SIM/USIM -card	- No SIM/USIM inserted into terminal - A damaged SIM/USIM inserted	Subscribers positioning not supported. Location of the mobile terminal based on the serving cell might work.

Table 3

Note 1. The cases 1, 2 a and 2 b will behave as the case 3, if the Emergency Call is set up before the GSM or UMTS authentication and location update procedures are fully performed by the network. No other calls than Emergency Calls can be done within this short, initial period.

Note 2. Implementation specific. Can also work as case 1 for emergency calls.

For all Emergency Call cases where the mobile subscribers identity is known it may be possible to make additional location information requests⁴ for updated location information. Consecutive positioning shall be possible within a reasonable time from when the call was originally made.

8 MLP implementation for Emergency Location information interface in Sweden

8.1 Notice of copyright

This chapter is derived from the Oftel document PNO-ISC/SPEC/013 "Emergency Location Information Interface", but shall not be confused with the original document. The information in this document has been modified and updated to support the Swedish requirements.

8.2 Glossary and terms in this chapter

This chapter uses the following definitions of terms.

Required	The sending node shall include elements marked required. The receiving node shall interpret all elements marked required.
Not Required	The sending node may send parameters marked not required, but should not expect interpretation by the receiving node. The receiving node may interpret these parameters.
Construction	Construction is a protocol element that consists of one or more sub-elements.

⁴ Consecutive positioning

8.3 Scope of this chapter

This chapter defines the MLP implementation that is used to transport location information associated with Emergency Calls to be used on the interface between Mobile Network Operators and the Emergency Service Operator.

One service is defined:

Emergency Location Immediate Service (ELIS) – This is a service used for querying of the location of a mobile subscriber that has initiated an Emergency Call. The response to this service is required immediately (within a set time).

This chapter;

- Identifies the sections of the LIF specification TS 101 v3.0.0 that are applicable to the emergency location information services
- Does not identify how the Mobile Network Operator determines location,
- Does not describe how the Emergency Call is established.

8.4 LIF TS 101 v3.0.0 Endorsement

This specification is based on the interface defined by the Location Interoperability Forum (LIF). The following table identifies sections within the LIF specification, and clarifies which options are applicable to a Swedish emergency location information service.

This specification identifies the minimum requirement. Elements not explicitly detailed in this section should be considered to be 'Not required'. Additional optional elements may be implemented on a bilateral basis.

LIF TS 101 1:st section	Title	Comment
1	Revision history	
2	Introduction	
3	General	
3.3	MLP extension mechanism	Required
4	Mobile Location Service Definitions	
4.1	Transport Protocol Layer Definitions	Required (See endorsement of Annex B)
4.2	Element Layer Definitions	
4.2.1	Identity Element Definitions	The following elements are required to be supported, and where an element is a construction, which elements are required to be supported within the construction; <ul style="list-style-type: none"> • msid

4.2.3	Location Element Definitions	<p>The following elements are required to be supported, and where an element is a construction, which elements are required to be supported within the construction;</p> <ul style="list-style-type: none"> • eme_pos <ul style="list-style-type: none"> ○ msid ○ pd ○ poserr • pd <ul style="list-style-type: none"> ○ time ○ shape • poserr <ul style="list-style-type: none"> ○ result ○ time • result • time
4.2.4	Shape Element Definitions	<p>The following elements are required to be supported, and where an element is a construction, which elements are required to be supported within the construction;</p> <ul style="list-style-type: none"> • shape <ul style="list-style-type: none"> ○ CircularArcArea ○ EllipticalArea ○ Point ○ Polygon • CircularArcArea <ul style="list-style-type: none"> ○ Coord ○ inRadius ○ outRadius ○ startAngle ○ stopAngle • EllipticalArea <ul style="list-style-type: none"> ○ coord ○ angle ○ semiMajor ○ semiMinor ○ angularUnit

		<ul style="list-style-type: none"> • Point <ul style="list-style-type: none"> ○ Coord • Polygon <ul style="list-style-type: none"> ○ outerboundaryIs ○ innerboundaryIs • Coord <ul style="list-style-type: none"> ○ X ○ Y • innerboundaryIs <ul style="list-style-type: none"> ○ LinearRing • outerboundaryIs <ul style="list-style-type: none"> ○ LinearRing • LinearRing <ul style="list-style-type: none"> ○ Coord ○ Coord ○ Coord ○ Coord* • X • Y • angle • semiMajor • semiMinor • angularUnit • inRadius • outRadius • startAngle • stopAngle <p>Mobile Network Operators are only required to support one of the shapes. The Emergency Service Operator is required to support all shapes.</p> <p>EllipticalArea shall be used for A-GPS and triangulation methods. CircularArcArea shall be used for CGI TA.</p>
4.2.6	Network Parameter Element Definitions	The following elements are required to be supported, and where an element is a construction, which elements are required to be supported within the

* Meaning zero or more occurrences

		<p>construction;</p> <ul style="list-style-type: none"> • gsm_net_param <ul style="list-style-type: none"> ○ neid • neid <ul style="list-style-type: none"> ○ vmscid • vmscid <ul style="list-style-type: none"> ○ vmscno • vmscno
4.2.7	Context Element Definitions	<p>The following elements are required to be supported, and where an element is a construction, which elements are required to be supported within the construction;</p> <ul style="list-style-type: none"> • client <ul style="list-style-type: none"> ○ id ○ pwd • id • pw
4.3	Service Layer Definitions	
4.3.1	Header Components	Required
4.3.1.1	Context DTD	<p>The following elements are required to be supported, and where an element is a construction, which elements are required to be supported within the construction;</p> <ul style="list-style-type: none"> • hdr <ul style="list-style-type: none"> ○ client
4.3.3	Emergency Location Immediate Service	Required
4.3.3.1	Emergency Location Immediate Request DTD	<p>The eme_lir shall contain the following elements</p> <ul style="list-style-type: none"> • msid • gsm_net_param
4.3.3.2	Emergency Location Immediate Answer DTD	<p>The eme_lia shall contain the following elements</p> <ul style="list-style-type: none"> • eme_pos, or • result
4.3.7	General Error Message	The gem shall contain the following

	Definition	elements <ul style="list-style-type: none"> • result
5	Elements and attributes in DTD	
5.4	Angle	Required: Mobile Network Operators are only required to support one of the shapes stated in 4.2. The Emergency Service Operator is required to support all shapes stated in 4.2.
5.5	AngularUnit	Not Required: Default 'Degrees' to be used
5.9	CircularArcArea	See Comment 5.4
5.12	CodeSpace	Not Required: Default value ' www.epsg.org #4326' used
5.14	DistanceUnit	Not Required: Default value 'meter' used
5.17	EllipticalArea	See Comment 5.4
5.23	id	Required
5.24	inRadius	See Comment 5.4
5.2.8	LinearRing	See Comment 5.4
5.37	msid	Required: Default "MSISDN" will be used
5.37.1	type	Required: Default "MSISDN" will be used
5.37.2	enc	Not Required. Default "ASC" will be used
5.44	StartAngle	See Comment 5.4
5.45	StopAngle	See Comment 5.4
5.4.7	Polygon	See Comment 5.4
5.49	Pwd	Required
5.54	Result	Required
5.54.1	ResId	Required
5.55	SemiMajor	See Comment 5.4
5.56	SemiMinor	See Comment 5.4
5.66	Time	Required

5.66.1	utc_off	Required
5.71	vmcno	Required
5.72	X	Required
5.73	Y	Required
5.75	Service Attributes	Required
5.75.1	ver	Required
6	Result Codes and Error Codes	
6.1	Result codes	Required
7	References	
	References (normative)	
	References (informative)	
8	Appendix A (Informative): Adaptation to 3GPP LCS	
9	Appendix B: Mapping to HTTP	<p>Encryption shall be handled with SSL/TLS. At least SSL v3.</p> <p>The lif-mlp-s (9211/tcp) port shall be used.</p> <p>Location client shall use separate HTTP posts and NOT use pipelining for time critical requests to avoid that one request delays other requests. Location Server shall process and respond to the separate HTTP posts out of order.</p>
9.2.1	Service Initiation DTD	<p>The svc_init shall contain the following elements</p> <p>hdr</p> <p>eme_lir</p>
9.2.2	Service Result DTD	<p>The svc_result shall contain the following elements</p> <p>eme_lia</p>
10	Appendix C: Geographical information	Only WGS84 Coordinate Reference System is required as defined by www.epsg.org #4326.

Annex A

(Informative)

1 Informative descriptions of MLP messages

1.1 Example messages

This annex provides example message formats associated with the defined sub-set of the LIF specification described in the document.

1.1.1 Emergency Location Immediate Request (ELIR)

<?xml version="1.0" ?>	
<!DOCTYPE svc_init SYSTEM "MLP_SVC_INIT_300.DTD">	
<svc_init ver="3.0.0">	Service initiation for MLP Version 3.0.0
<hdr ver="3.0.0">	Header for MLP Version 3.0.0
<client>	Who is requesting this location fix
<id>SOS</id>	Emergency operator registered user name for login
<pwd>112112</pwd>	Emergency operator password for login
</client>	
</hdr>	
<eme_lir ver="3.0.0">	Emergency Location Immediate Request for MLP Version 3.0.0
<msid>46705005764</msid>	Type is default, MSISDN, formatted as CC+NDC+SN (GSM/3GPP should conform to 3GPP CN TS 23.003)
<gsm_net_param>	gsm_net_param and it's sub parameters are used to transfer vmscno.
<neid>	
<vmscid>	
<vmscno>46705012345</vmscno>	In GSM this is the Global Title address. The Global Title is formatted as described in section 7.3.2. It is mainly transferred in the MLP request to allow for the GMLC to not request the HLR which is especially useful in roaming scenarios
</vmscid>	
</neid>	
</gsm_net_param>	
</eme_lir>	
</svc_init>	

1.1.2 Emergency Request Immediate Answer (ELIA) – Valid Response

1.1.2.1 ELIA using CGI TA

<?xml version="1.0" ?>	
<!DOCTYPE svc_init SYSTEM "MLP_SVC_RESULT_300.DTD">	
<svc_result ver="3.0.0">	Service result for MLP Version 3.0.0
<eme_lia ver="3.0.0">	Emergency Location Immediate Answer for MLP Version 3.0.0
<eme_pos>	Position answer
<msid type="MSISDN">468855277</msid>	Position is for this MSISDN (formatted as CC+NDC+SN) (GSM/3GPP should conform to 3GPP CN TS 23.003)
<pd>	Position description
<time utc_off="+0100">20020702115712</time>	Local Date and Time of phone when position was measured.
<shape>	Shape of uncertainty area
<CircularArcArea>	It's a CircularArcArea (on the WGS-84 co-ordinate reference system as default).
<coord>	Coordinate of the centre of the point
<X>N51.514</X>	Latitude in decimal degrees prefixed with N or S, expressed with 3 to 5 decimals
<Y>W0.102</Y>	Longitude in decimal degrees prefixed with E or W, expressed with 3 to 5 decimals
</coord>	
<inRadius>500</inRadius>	The distance in meters between center of the circle and arc closest to the center
<outRadius>1000</outRadius>	The distance in meters between center of the circle and arc furthest away from the center
<startAngle>20</startAngle>	The angle in degrees between North and the first defined radius
<stopAngle>60</stopAngle>	The angle in degrees between North and the second defined radius
</shape>	
</pd>	
</eme_pos>	
</eme_lia>	
</svc_result>	

1.1.2.2 ELIA using AGPS or triangulation method

<?xml version="1.0" ?>	
<!DOCTYPE svc_init SYSTEM "MLP_SVC_RESULT_300.DTD">	
<svc_result ver="3.0.0">	Service result for MLP Version 3.0.0
<eme_lia ver="3.0.0">	Emergency Location Immediate Answer for MLP Version 3.0.0
<eme_pos>	Position answer
<msid type="MSISDN">468855277</msid>	Position is for this MSISDN (formatted as CC+NDC+SN) (GSM/3GPP should conform to
<pd>	Position description
<time utc_off="+0100">20020702115712</time>	Local Date and Time of phone when position was measured.
<shape>	Shape of uncertainty area
<EllipticalArea>	It's an ellipse (on the WGS-84 co-ordinate reference system as default).
<coord>	Coordinate of the centre of the point
<X>N51.514</X>	Latitude in decimal degrees prefixed with N or S, expressed with 3 to 5 decimals
<Y>W0.102</Y>	Longitude in decimal degrees prefixed with E or W, expressed with 3 to 5 decimals
</coord>	
<angle>90</angle>	Angle in degrees of rotation of the ellipse measured clockwise from north
<semiMajor>50</semiMajor>	Length of semiMajor axis in metres
<semiMinor>50</semiMinor>	Length of semiMinor axis in metres
</EllipticalArea>	
</shape>	
</pd>	
</eme_pos>	
</eme_lia>	
</svc_result>	

1.1.3 Emergency Location Immediate Answer – Error response

<?xml version="1.0" ?>	
<!DOCTYPE svc_init SYSTEM "MLP_SVC_RESULT_300.DTD">	
<svc_result ver="3.0.0">	Service result for MLP Version 3.0.0
<eme_lia ver="3.0.0">	Emergency Location Immediate Answer for MLP Version 3.0.0
<eme_pos>	Position answer

<pre> <msid type="MSISDN">46705005764</msid> </pre>	Position is for this MSISDN (formatted CC+NDC+SN) (GSM/3GPP should conform to 3GPP CN TS 23.003)
<pre> <poserr> </pre>	
<pre> <result resid="004"> UNKNOWN SUBSCRIBER </result> </pre>	Error code number and error code text
<pre> <time utc off="+0100">20020702115712</time> </pre>	Local Date and Time of phone when position attempt was made
<pre> </poserr> </pre>	
<pre> </eme_pos> </pre>	
<pre> </eme_lia> </pre>	
<pre> </svc_result> </pre>	