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TECHNICAL SPECIFICATION

Digital cellular telecommunications system (Phase 2+);
Location Services (LCS);
Serving Mobile Location Centre -
Base Station System (SMLC-BSS) interface;
Layer 3 specification
(3GPP TS 48.071 version 13.0.0 Release 13)

GLOBAL SYSTEM FOR
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Contents

Foreword

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1 Scope

The present document contains the coding of information necessary for support of location service operation on the SMLC-BSS interface layer 3.

Clause 2 gives the functional definitions and contents of messages for location service operations. Clause 3 gives the general format and coding for messages used for location service and the format and coding of information elements used for location service operations.

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.

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

[2]   3GPP TS 43.059: "Functional stage 2 description of Location Services (LCS) in GERAN".

[3]   3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[4]   3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[4a]   3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".

[5]   3GPP TS 45.008: "Radio subsystem link control".

[6]   3GPP TS 48.008: "Mobile Switching Centre - Base Station System (MSC-BSS) interface; Layer 3 specification".

[7]   3GPP TS 49.031: "Location Services (LCS); Base Station System Application Part LCS Extension (BSSAP-LE)".

[8]   3GPP TS 44.031: "Location Services (LCS); Mobile Station (MS) - Serving Mobile Location Centre (SMLC) Radio Resource LCS Protocol (RRLP)".

3 Definitions and abbreviations

For the purposes of the present document, the abbreviations, terms and definitions given in 3GPP TR 21.905 and 3GPP TS 43.059 apply.

4 Messages functional definitions and contents

4.1 General

This sub-clause defines the structure of the messages of the SMLC-BSS layer 3 protocol defined in 3GPP TS 43.059.

Each definition includes:

a) a brief description of the message;

b) a table listing the information elements in the order of their appearance in the message.

   For each IE the table indicates:

   1) the name of the IE (which gives an idea of the semantics of the element), which is used in this and other specifications as a reference to the IE within the message;

   2) the name of the type of the IE (which indicates the coding of the value part of the IE), and a reference to a description of the value part of the IE;

   3) the presence requirement indication (M, C or O) for the IE, as defined in 3GPP TS 24.007;

   4) the format of the IE (T, V, TV, LV, TLV) as defined in 3GPP TS 24.007;

   5) the length of the IE (or permissible range of lengths), in octets, in the message. The value of the length gives the number of octets in the IE following the length and element identifier. Where the length is encoded using more than one octet, the high order bit is bit 8 of the first (lowest numbered octet) and the low order bit is bit 1 of the last (highest numbered octet). When a length has a range of M to N octets, the notation "M-N" is used. The symbol "n" represents the maximum of a range when indefinite.

c) sub-clauses specifying conditions for IEs with presence requirement C or O in the relevant message. Together with other conditions specified in 3GPP TS 43.059 this defines when the IE shall be included or not, what non-presence of such IEs means, and (for IEs with presence requirement C) the static conditions for presence and/or non-presence of the IEs (see 3GPP TS 43.059).

4.2 Messages

The following Location Services related messages are exchanged between the SMLC and the BSS:

- TA Request;

- TA Response;

- Reject;

- Reset;

- Abort;

- TA Layer3;

- MS Position Command;

- MS Position Response;

- U-TDOA Request;

- U-TDOA Response.

On the Lb interface the messages are contained in the BSSLAP APDU IE which is encapsulated in the following messages as specified in 3GPP TS 49.031:

- BSSMAP-LE CONNECTION ORIENTED INFORMATION message (for all messages except the TA LAYER 3 message);

- BSSMAP-LE PERFORM LOCATION REQUEST message (for the TA LAYER 3 message)

- BSSMAP-LE PERFORM LOCATION INFORMATION message (for the TA LAYER 3 message).

4.2.1 TA Request

The TA Request is a message from the SMLC to the BSS, requesting BSS to return the timing advance (or access delay) of the MS.

Table 4.2.1.1: TA Request message content

Information element	Type/Reference	Presence	Format	Length
Message Type	Message Type IE / 5.1	M	V	1

4.2.2 TA Response

The TA Response is a message from the BSS to the SMLC. It is a response to TA Request message and contains the following information elements.

Table 4.2.2.1: TA Response message content

Information element	Type/Reference	Presence	Format	Length
Message Type	Message Type IE / 5.1	M	V	1
Serving Cell Identity	Cell Identity IE / 5.4	M	TV	3
Timing Advance	Timing Advance IE / 5.2	M	TV	2
Measurement Report	Measurement Report IE / 5.12	O	TLV	18
Enhanced Measurement Report	Enhanced Measurement Report IE / 5.18	O	TLV	4-n
Measured Cell Identity List	Cell Identity List IE / 5.17	O	TLV	6-n
Concurrent Method Flag	Concurrent Positioning Flag IE / 5.34	O (note 1)	TV	2
NOTE 1: This IE is only included when the BSC allows a concurrent invocation of a first and second positioning procedure				

4.2.3 (void)

4.2.4 (void)

4.2.5 Reject

The Reject is a message from the BSS to the SMLC. It is a possible response to TA Request, MS Position Command or U-TDOA Request and contains the following information elements.

Table 4.2.5.1: Reject message content

Information element	Type/Reference	Presence	Format	Length
Message Type	Message Type IE / 5.1	M	V	1
Cause	Cause IE / 5.14	M	TV	2

The following are the expected cause values for Reject message:

- congestion;

- channel Mode not supported;

- positioning procedure not supported;

- failure for other radio related events;

- incorrect serving cell identity;

- BSSAP-LE Segmentation error;

- Concurrent Positioning not enabled.

4.2.6 Reset

The Reset is a message from the BSS to the SMLC. It is sent when the Response message contents for a positioning request are invalidated (e.g. due to handover) before the positioning procedure was completed.

Table 4.2.6.1: Reset message content

Information element	Type/Reference	Presence	Format	Length
Message Type	Message Type IE / 5.1	M	V	1
Cell ID	Cell Identity IE / 5.4	M	TV	3
Timing Advance	Timing Advance IE / 5.2	M	TV	2
Channel description	Channel Description IE / 5.8	M	TV	4
Cause	Cause IE / 5.1	M	TV	2
Measurement Report	Measurement Report IE / 5.12	O	TLV	18
Enhanced Measurement Report	Enhanced Measurement Report IE / 5.18	O	TLV	4-n
Measured Cell Identity List	Cell Identity List IE / 5.17	O	TLV	6-n
LAC	Location Area Code IE / 5.19	O	TV	3
Frequency List	Frequency List IE 5.20	C (note 1)	TLV	3-n
Channel Mode	Channel Mode IE 5.26	C (notes 2 & 4)	TV	2
MultiRate Configuration	MultiRate Configuration 5.27	C (notes 3 & 4)	TLV	4-n
Packet Channel Description	Packet Channel Description IE 5.29	C (note 5)	TV	4
TLLI	TLLI IE 5.30	C (note 5)	TV	5
TFI	TFI 5.31	C (note 5)	TV	2
TBF Starting Time	Starting Time IE 5.32	C (note 5)	TV	3
Encryption Key (Kc)	Encryption Key IE 5.24	C (note 6)	TV	9
Cipher Mode Setting	Cipher Mode Setting IE 5.25	C (note 4)	TV	2
Long Encryption Key (Kc128)	Long Encryption Key IE 5.33	C(note 7)	TV	17
NOTE 1: The Frequency List IE is included only for U-TDOA when frequency hopping is used.				
NOTE 2: The Channel Mode IE is included only for U-TDOA using FR or AMR (not included for EFR).				
NOTE 3: The MultiRate Configuration IE is included only for U-TDOA using AMR.				
NOTE 4: This IE can only be present for CS U-TDOA location method				
NOTE 5: This IE can only be present for PS U-TDOA location method				
NOTE 6: This IE can only be present for CS U-TDOA location method and if the Ciphering Mode Setting IE indicates A5/1 or A5/3.				
NOTE 7: This IE can only be present for CS U-TDOA location method and if the Ciphering Mode Setting IE indicates A5/4.				

The following are the expected cause values for Reset message:

- intra-BSS handover;

- failure for other radio related events;

- supervision Timer Expired;

- incorrect serving cell identity.

4.2.7 Abort

The Abort is a message from the BSS to the SMLC. Upon receiving this signal, the SMLC shall abort ongoing positioning procedure.