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**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 10.1.0 Release 10)**

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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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.
- 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 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

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.

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.

Table 4.2.7.1: Abort 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 Abort message:

- failure for other radio related events;
- supervision Timer Expired;
- inter BSS handover;
- loss of signalling connection to MS.

4.2.8 TA Layer3

The TA Layer3 is an optional encapsulated message from the BSS to the SMLC that adds the following information in Complete layer 3 Information as described in 3GPP TS 48.008.

Table 4.2.8.1: TA Layer3 message content

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

4.2.9 MS Position Command

The BSSLAP MS Position Command is a message from the SMLC to BSS that contains the following information elements.

Table 4.2.9.1: MS Position Command message content

Information element	Type/Reference	Presence	Format	Length
Message Type	Message Type IE / 5.1	M	V	1
flag	RRLP flag IE / 5.15	M	TV	2
RRLP Info	RRLP IE / 5.16	M	TLV	3-n

4.2.10 MS Position Response

The BSSLAP MS Position Response is a message from the BSS to the SMLC that contains the following information elements.

Table 4.2.10.1: MS Position Response message content

Information element	Type/Reference	Presence	Format	Length
Message Type	Message Type IE / 5.1	M	V	1
flag	RRLP flag IE / 5.15	M	TV	2
RRLP Info	RRLP IE / 5.16	M	TLV	3-n
Timing Advance	Timing Advance IE / 5.2	O	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

4.2.11 U-TDOA Request

The U-TDOA Request is a message from the SMLC to the BSS. It contains the following information elements.

Table 4.2.11.1: U-TDOA Request message content

Information element	Type/Reference	Presence	Format	Length
Message Type	Message Type IE 5.1	M	V	1
Delta Timer	Delta Timer IE 5.22	O (note 1)	TV	2
Polling Repetition	Polling Repitition IE 5.28 (note)	C (note 2)	TV	2
NOTE 1: This IE can only be present for CS U-TDOA location method				
NOTE 2: This IE is only present for PS U-TDOA location method				

4.2.12 U-TDOA Response

The U-TDOA Response is a message from the BSS to the SMLC. It is a response to the U-TDOA Request message. It contains the following information elements.

Table 4.2.12.1: U-TDOA Response message content

Information element	Type/Reference	Presence	Format	Length
Message Type	Message Type IE 5.1	M	V	1
Channel Description	Channel Description IE 5.8	M	TV	4
Serving Cell Identifier	Cell Identifier IE 5.23	M	TLV	4-n
Frequency List	Frequency List IE 5.20	C (note 3)	TLV	3-n
Timing Advance	Timing Advance IE 5.2	O	TV	2
MS Power	MS Power IE 5.21	O	TV	2
Measurement Report	Measurement Report IE 5.12	O	TLV	18
Encryption Key (Kc)	Encryption Key IE 5.24	C (note 7)	TV	9
Cipher Mode Setting	Cipher Mode Setting IE 5.25	C (note 4)	TV	2
Channel Mode	Channel Mode IE 5.26	C (notes 1 & 4)	TV	2
MultiRate Configuration	MultiRate Configuration IE 5.27	C (notes 1 & 4)	TLV	4-n
Measured Cell Identity List	Cell Identity List IE / 5.17	O	TLV	6-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 IE 5.31	C (note 5)	TV	2
TBF Starting Time	Starting Time IE 5.32	C (note 5)	TV	3
Power-Up Starting Time	Starting Time IE 5.32	O (note 6)	TV	3
Long Encryption Key (Kc128)	Long Encryption Key IE 5.33	C (note 8)	TV	17

NOTE 1: The Channel Mode IE is included only for U-TDOA using FR or AMR (not included for EFR).
NOTE 2: The MultiRate Configuration IE is included only for U-TDOA using AMR.
NOTE 3: The Frequency List IE is included only when frequency hopping is used. 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: The Power-Up Starting Time IE is included if the Power-Up procedure is supported for U-TDOA location method. It represents the starting time of the power-up and DTX suspension.
NOTE 7: 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 8: This IE can only be present for CS U-TDOA location method and if the Ciphering Mode Setting IE indicates A5/4.

5 Information element encodings

This paragraph contains the coding of the signalling elements used.

The following conventions are assumed for the sequence of transmission of bits and bytes:

- each bit position is marked as 1 to 8. Bit 1 is the least significant bit and is transmitted first;
- in an element octets are identified by number, octet 1 is transmitted first, then octet 2 etc.

When a field extends over more than one octet, the order of bit values progressively decreases as the octet number increases. The least significant bit of the field is represented by the lowest numbered bit of the highest numbered octet of the field.

- For variable length elements a length indicator is included, this indicates the number of octets following in the element.
- All fields within Information Elements are mandatory unless otherwise specified. The Information Element Identifier shall always be included.

All spare bits are set to 0.

The elements used and their coding are:

Table 5.1: Element Indentifier codes

Element Identifier Coding	Element name	Reference
0000 0001	Timing Advance	5.2
0000 1000	Reserved (note)	
0000 1001	Cell Identity	5.4
0000 1010	Reserved (note)	
0000 1011	Reserved (note)	
0000 1100	Reserved (note)	
0001 0000	Channel Description	5.8
0001 0001	Reserved (note)	
0001 0010	Reserved (note)	
0001 0011	Reserved (note)	
0001 0100	Measurement Report	5.12
0001 0101	Reserved (note)	
0001 1000	Cause	5.14
0001 1001	RRLP Flag	5.15
0001 1011	RRLP IE	5.16
0001 1100	Cell Identity List	5.17
0001 1101	Enhanced Measurement Report	5.18
0001 1110	Location Area Code	5.19
0010 0001	Frequency List	5.20
0010 0010	MS Power	5.21
0010 0011	Delta Timer	5.22
0010 0100	Serving Cell Identifier	5.23
0010 0101	Encryption Key (Kc)	5.24
0010 0110	Cipher Mode Setting	5.25
0010 0111	Channel Mode	5.26
0010 1000	MultiRate Configuration	5.27
0010 1001	Polling Repetition	5.28
0010 1010	Packet Channel Description	5.29
0010 1011	TLLI	5.30
0010 1100	TFI	5.31
0010 1101	TBF Starting Time	5.32
0010 1110	Power-Up Starting Time	5.32
0010 1111	Long Encryption Key (Kc128)	5.33
NOTE: These values of the codepoints shall not be used as they were used in an earlier version of the protocol.		

All unassigned codes are spare.

5.1 Message Type IE

Message Type uniquely identifies the message being sent. It is a single octet element, mandatory in all messages.

All unassigned codes are spare.

Table 5.1.1: Message Type codes

8 7 6 5 4 3 2 1	
0 0 0 0 0 0 0 0	Reserved.
0 0 0 0 0 0 0 1	TA REQUEST
0 0 0 0 0 0 1 0	TA RESPONSE
0 0 0 0 0 1 0 0	Reserved (note)
0 0 0 0 0 1 0 1	Reserved (note)
0 0 0 0 1 0 1 0	REJECT
0 0 0 0 1 0 1 1	RESET
0 0 0 0 1 1 0 0	ABORT
0 0 0 0 1 1 0 1	TA LAYER3
0 0 0 0 1 1 1 1	MS Position Command
0 0 0 1 0 0 0 0	MS Position Response
0 0 0 1 0 0 0 1	U-TDOA Request
0 0 0 1 0 0 1 0	U-TDOA Response
NOTE: These values of the codepoints shall not be used as they were used in an earlier version of the protocol.	

5.2 Timing Advance IE

This element contains the Timing Advance measured by the BTS.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Timing Advance								octet 2

Figure 5.2.1: Timing Advance IE

The coding of the timing advance value field is the binary representation of the timing advance in bit periods; 1 bit period = 48/13 us, as described in 3GPP TS 44.018 with the difference that all 8 bits are significant (instead of the normal 6 bits), which is necessary in order to report TA from extended range cells. To be correct, values over 63 do not correspond to a TA used by the MS (maximum is 63). Instead values over 63 correspond to the access delay measured by the BTS.

5.3 (void)

5.4 Cell Identity IE

This element defines the cell identity of the MS serving cell.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Cell Identity								octet 2-3

Figure 5.4.1: Cell Identity IE

The coding of the Cell Identity field is as defined in 3GPP TS 24.008 (excluding IEI).

5.5 (void)

5.6 (void)

5.7 (void)

5.8 Channel Description IE

This element defines the physical channel allocation of the MS.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Channel Description								octets 2-4

Figure 5.8.1: Channel Description IE

The coding of Channel Description field is as defined in 3GPP TS 44.018 (excluding IEI).

5.9 (void)

5.10 (void)

5.11 (void)

5.12 Measurement Report IE

This element contains the measurement report from the BSS.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Length								octet 2
Measurement Results								octet 3-18

Figure 5.12.1: Measurement Report IE

The Measurement Results field is encoded as in 3GPP TS 44.018 (excluding IEI) with the changes specified below.

DTX-USED
The DTX-USED bit shall be set as the DTXd field in the UPLINK MEASUREMENTS message in 3GPP TS 48.058.
If the DTX-USED field is set to "0" the SMLC shall use the RXLEV-FULL and RXQUAL-FULL values.
If the DTX-USED field is set to "1" the SMLC shall use the RXLEV-SUB and RXQUAL-SUB values.

RXLEV-FULL-SERVING-CELL and RXLEV-SUB-SERVING-CELL
When the values of RXLEV-FULL-SERVING-CELL and RXLEV-SUB-SERVING-CELL from TS 44.018 are 0 or 63, then their value shall be encoded to the Measurement Results without change. Otherwise, the values of RXLEV-FULL-SERVING-CELL and RXLEV-SUB-SERVING-CELL shall be added with 2 times the power reduction value corresponding to the Power Level field in the BS POWER message in 3GPP TS 48.058. A result higher than the upper boundary shall be limited to 63 to avoid value out of range.

RXLEV-FULL-SERVING-CELL (parameter in Measurement Results)
= RXLEV-FULL-SERVING-CELL (parameter from TS 44.018, in octet 2 of NMR section 10.5.2.20)
+ 2*(Power Level field in the BS POWER message)

RXLEV-SUB-SERVING-CELL (parameter in Measurement Results)
= RXLEV-SUB-SERVING-CELL (parameter from TS 44.018)
+ 2*(Power Level field in the BS POWER message)

Example: If Power Level is "0010" then
RXLEV-FULL-SERVING-CELL (parameter in Measurement Results)
= RXLEV-FULL-SERVING-CELL (parameter from TS 44.018) + (2*2)

5.13 (void)

5.14 Cause IE

This element contains the cause value.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Cause value								octet 2

Figure 5.14.1: Cause IE

The cause field is coded as follows:

Table 5.14.1: Cause IE coding

0000 0000	Congestion
0000 0001	Channel Mode not supported
0000 0010	Positioning procedure not supported
0000 0011	Failure for other radio related events
0000 0100	Intra-BSS handover
0000 0101	Supervision Timer Expired
0000 0110	Inter-BSS handover
0000 0111	Loss of signalling connection to MS
0000 1000	Incorrect serving cell identity
0000 1001	BSSAP-LE Segmentation error
All unassigned codes are spare.	

5.15 RRLP Flag IE

This element is coded as:

8	7	6	5	4	3	2	1	
Element identifier								octet 1
SPARE							Flag1	octet 2

Figure 5.15.1: RRLP Flag IE

The fields are coded as follows:

Flag 1 (Octet 2, bit 1):

0 Position Command (SMLC to BSC) or final response (BSC to SMLC).

1 Not a Positioning Command or final response.

5.16 RRLP IE

RRLP IE is coded as:

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Length								octet 2-3
RRLP APDU (3GPP TS 44.031)								octet 4-n

Figure 5.16.1: RRLP IE

5.17 Cell Identity List IE

This element defines the list of cell identities of neighbour cells, for which measurements are reported. The Cell Identities are listed in the same order than the corresponding measurements in the (Enhanced) Measurement Report IE.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Length								octet 2
Spare				Cell identification Discriminator 1				octet 3
Cell Identification 1								octet 4 to (4+p)
…								
Spare				Cell identification Discriminator N				octet (n-q-1)
Cell Identification N								octet (n-q) to n

Figure 5.17.1: Cell Identity IE

The coding of octet 2 is a binary number indicating the Length of the remaining element. The Length depends on the Cell identification discriminator i as well as the number of cells to be identified.

The Cell identification discriminator i is coded as follows:

0000 The whole Cell Global Identification, CGI, is used to identify the 2G cells.
0001 Location Area Code, LAC, and Cell Identify, CI, are used to identify the 2G cells.
0010 3G Cell identification container 1.
0011 3G Cell identification container 2.

All other values are reserved.

The coding of the Cell Identification i depends on the Cell identification discriminator i. Below the coding of the i-th Cell Identification is shown for each Cell identification discriminator (with "i" in the range 1 to n):

Coding of the i-th Cell Identification for Cell identification discriminator = 0000.

8	7	6	5	4	3	2	1	
MCC dig 2				MCC dig 1				octet x+1
MNC dig 3				MCC dig 3				octet x+2
MNC dig 2				MNC dig 1				octet x+3
LAC								octet x+4
LAC cont.								octet x+5
CI value								octet x+6
CI value cont								octet x+7

Figure 5.17.2: Cell identification for discriminator = 0000

The octet (x+2) bits 5-8 are filled by '1111' if 2 digit MNC is used.

The octets (x+1)-(x+5) are coded as the value part shown in 3GPP TS 24.008, Table 'Location Area Identification information element'.

The octets (x+6)-(x+7) are coded as the value part shown in 3GPP TS 24.008, Table 'Cell Identity information element'.

Coding of i-th Cell Identification for Cell identification discriminator = 0001.

8	7	6	5	4	3	2	1	
LAC								octet x+1
LAC cont.								octet x+2
CI value								octet x+3
CI value cont								octet x+4

Figure 5.17.3: Cell identification for discriminator = 0001

The octets (x+1)-(x+2) are coded as the value part shown in 3GPP TS 24.008, Table 'Location Area Identification information element'.

The octets (x+3)-(x+4) are coded as the value part shown in 3GPP TS 24.008, Table 'Cell Identity information element'.

Coding of the Target ID for Cell identification discriminator = 0010.

Octets (x+1) to (x+9) shall be ignored by the receiver.

NOTE: in the 3G Cell identification container 1, the transmitter may send PLMN-ID, LAC, RNC-ID and C-ID to identify a 3G cell.

Coding of the Target ID for Cell identification discriminator = 0011.

Octets (x+1) to (x+6) shall be ignored by the receiver.

NOTE: In the 3G Cell identification container 2, the transmitter may send LAC, RNC-ID and C-ID to identify a 3G cell.

5.18 Enhanced Measurement Report IE

This element contains the measurement report from the BSS.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Length								octet 2
Enhanced Measurement Results								octet 3-n

Figure 5.18.1: Enhanced Measurement Report IE

The Enhanced Measurement Results field is encoded as the contents of the ENHANCED MEASUREMENT REPORT message in 3GPP TS 44.018 (excluding the fields: "RR short PD", "Message type" and "Short layer 2 header") with the changes specified below.

RXLEV_VAL for serving cell
When the values of RXLEV_VAL from TS 44.018 is 0 or 63, then its value shall be encoded to the Enhanced Measurement Results without change. Otherwise, the value of RXLEV_VAL shall be added with 2 times the power reduction value corresponding to the Power Level field in the BS POWER message in 3GPP TS 48.058. A result higher than the upper boundary shall be limited to 63 to avoid value out of range.

RXLEV_VAL (parameter in Enhanced Measurement Results)
= RXLEV_VAL (parameter from TS 44.018 in section 9.1.55)
+ 2*(Power Level field in the BS POWER message)

Example: If Power Level is "0010" then
RXLEV_VAL (parameter in Enhanced Measurement Results)
= RXLEV_VAL (parameter from TS 44.018) + (2*2).

5.19 Location Area Code IE

This element defines the cell identity of the MS serving cell.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Location Area Code								octet 2-3

Figure 5.19.1: Location Area Code IE

The coding of the Location Area Code field is as defined in 3GPP TS 24.008 (excluding IEI, MCC, and MNC).

5.20 Frequency List IE

The Frequency List IE contains a list of frequencies used by the MS.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Length								octet 2
Frequency List								octets 3-n

Figure 5.20.1: Frequency List IE

The coding of Frequency List field is as defined in 3GPP TS 44.018 (excluding IEI and length field).

5.21 MS Power IE

This element contains the MS power.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
MS Power								octet 2

Figure 5.21.1: MS Power IE

The MS Power field is encoded as in 3GPP TS 44.018 (excluding IEI) and 3GPP TS 45.005.

5.22 Delta Timer IE

This element contains the value of the delta timer. The coding is as follows.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Timer Value								octet 2

Figure 5.22.1: Delta Timer IE

The Timer Value field is expressed in units of 0,1s.

5.23 Serving Cell Identifier IE

This element uniquely identifies a cell within a BSS and is of variable length containing the following fields:

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Length								octet 2
Spare				Cell identification discriminator				octet 3
Cell identification								octet 4-n

Figure 5.23.1: Serving Cell Identifier IE

The Serving Cell Identifier IE is encoded as in 3GPP TS 48.008 (excluding IEI and length field).

5.24 Encryption Key IE

This element defines the encryption key (Kc) of the MS being located.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Encryption Key (Kc)								octet 2-9

Figure 5.24.1: Encryption Key IE

The Encryption Key (Kc) field contains the ciphering key to be used in connection with the encryption algorithms A5/1 and A5/3 as provided to the BSS by the MSC in the Encryption Information IE and as defined in TS 48.008.

5.25 Cipher Mode Setting IE

The purpose of the Cipher Mode Setting information element is to indicate whether stream ciphering shall be started or not and if it is to be started, which algorithm to use.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Spare	Ciph Mod Set IEI			algorithm identifier			SC	octet 2

Figure 5.25.1: Cipher Mode Setting IE

The Cipher Mode Setting information element is coded as defined in TS 44.018 (excluding IEI).

5.26 Channel Mode IE

The purpose of the Channel Mode information element is to indicate the mode on coding/decoding and transcoding.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Mode								octet 2

Figure 5.26.1: Channel Mode IE

The Channel Mode information element is coded as defined in TS 44.018 (excluding IEI).

5.27 MultiRate Configuration IE

The purpose of the MultiRate Configuration information element is to provide all parameters relevant to multi-rate speech codec.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Length								octet 2
Multirate speech version			NSCB	ICMI	Spare	Start mode		octet 3
Parameters for multirate speech								octet 4 - n

Figure 5.27.1: MultiRate Configuration IE

The MultiRate Configuration information element is coded as defined in TS 44.018 (excluding IEI).

5.28 Polling Repetition IE

This element contains the value of the number of repetitions of the Packet Polling Request procedure. The coding is as follows:

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Spare		Number of polling repetitions (binary)						octet 2

Figure 5.26.1: Polling Repetition IE

The Polling Repitition IE is a binary representation in the range of 4-63.

5.29 Packet Channel Description IE

This element contains the timeslot allocation and frequency parameters. The coding is as follows.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
CSN.1 binary representation of the channel parameters as described in TS 44.018 (CCCH) or TS 44.060 (PCCCH) plus padding bits (binary 0) as required to achieve 4 complete octets								octets 2-5

Figure 5.29.1: Packet Channel Description IE

5.30 TLLI IE

The purpose of the *TLLI* information element is to provide the Temporary Logical Link Identifier.

8	7	6	5	4	3	2	1	
Element Identifier								octet 1
TLLI value								octet 2
TLLI value (contd)								octet 3
TLLI value (contd)								octet 4
TLLI value (contd)								octet 5

Figure 5.30.1: TLLI IE

The TLLI information element is coded as defined in TS 44.018 (excluding IEI).

5.31 TFI IE

This element contains the value of the TFI. The coding is as follows.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Spare			TFI					octet 2

Figure 5.31.1: TFI IE

The TFI information element is coded as defined in TS 44.060 (excluding IEI).

5.32 Starting Time IE

The purpose of the *Starting Time* information element is to provide the start TDMA frame number, FN modulo 42432 of the first transmission of the Packet Polling Request or first block of user data associated with the U-TDOA location method from the BSS to the MS. In the case that the power-up procedure for U-TDOA is supported, the *Starting Time* information element may provide the starting frame number of the power-up and DTX suspension.

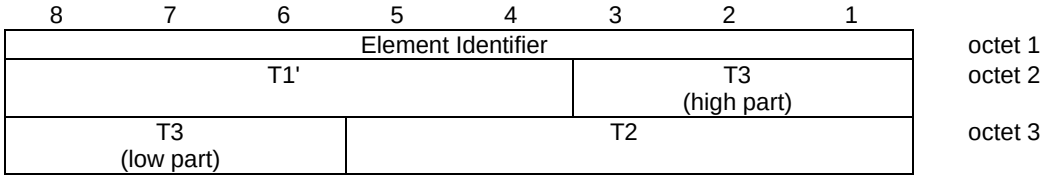

Figure 5.32.1: *Starting Time* IE

The Starting Time information element is coded and interpreted as defined in TS 44.018 (excluding IEI).

5.33 Long Encryption Key IE

This element defines the 128 bit encryption key (Kc128) of the MS being located.

8	7	6	5	4	3	2	1	
Element identifier								octet 1
Long Encryption Key (Kc128)								octet 2-17

Figure 5.24.1: Long Encryption Key IE

The Long Encryption Key (Kc128) field contains the ciphering key to be used in connection with encryption algorithm A5/4 as provided to the BSS by the MSC as defined in TS 48.008.

Annex A (informative): Change history

Meeting/Date	Tdoc	CR	Rev	Subject/Comment	New version
March 2011				Version 10.0.0 based on version 9.0.0	10.0.0
April 2011				"v" in coversheet version number capitalized; copyright block updated.	10.0.1
GP-53	GP-120312	0037	1	Inclusion of support for 128 bits encryption key	10.1.0

History

Document history		
V10.0.1	May 2011	Publication
V10.1.0	March 2012	Publication