

**3GPP TSG\_CN#6**  
**ETSI SMG3 Plenary Meeting #6,**  
**Nice, France**  
**13<sup>th</sup> – 15<sup>th</sup> December 1999**

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**NP-99538**

**Agenda item:** 5.1.3  
**Source:** Ericsson  
**Title:** Revised CR to 09.31 on work item LCS

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**Introduction:**

This document contains a revised CR to GSM 09.31. The changes in this CR were endorsed by N1 (original document N1-99F18). Due to concerns from the SMG2 chair, all references to segmentation have been removed.

Tdoc	Spec	CR	R ev	CAT	Rel.	Old Ver	New Ver	Subject
	09.31	A001	3	C	R98	3.0.0	3.1.0	Addition of further LCS functionality in GSM Release 98



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**\*\*\* FIRST MODIFIED SECTION \*\*\***

## 9. Message Functional Definitions and Contents

### 9.1 BSSMAP-LE PERFORM LOCATION REQUEST message

This message is sent to request a location estimate for a target MS and contains sufficient information to enable location according to the required QoS using any positioning method supported by the PLMN and, where necessary, MS. The message is also used to request LCS assistance data transfer to an MS or request a deciphering key for LCS broadcast assistance data. The message can be sent from the BSC to the SMLC and from the MSC to the SMLC.

**Table 9.1: BSSMAP-LE PERFORM LOCATION REQUEST message content**

Information element	Type / Reference	Presence	Format	Length in octets
Message type	Message Type <del>17.4.1.4</del>	M	V	1
Location Type	Location Type	M	TLV	4
Cell Identifier	Cell Identifier	M	TLV	3-10
Classmark Information Type 3	Classmark Information Type 3	O	TLV	2-n
LCS Client Type	LCS Client Type	O	TLV	3
Chosen Channel	Chosen Channel	O	TLV	<del>2</del> -n
LCS Priority	LCS Priority	O	TLV	3
LCS QoS	LCS QoS	O	TLV	6
GPS Assistance Data	GPS Assistance Data	O	TLV	3-n
BSSLAP APDU	APDU	O	TLV	2-n

#### 9.1.1 Location Type

This parameter defines the type of location information being requested.

#### 9.1.2 Cell Identifier

This parameter gives the current cell location of the target MS. The format shall either be the cell global identification or the LAC plus CI form.

#### 9.1.3 Classmark Information Type 3

This parameter indicates the positioning methods supported by the MS as obtained from the MS Classmark 3 received earlier from the target MS.

#### 9.1.4 LCS Client Type

This parameter defines the type of the originating LCS Client. It may be included to assist an SMLC to appropriately prioritize a location request.

#### 9.1.5 Chosen Channel

This parameter defines the type of radio channel currently assigned to the target MS.

## 9.1.6 LCS Priority

This parameter defines the priority of the location request.

## 9.1.6 LCS QoS

This parameter provides the required Quality of Service for the LCS Request. Quality of Service may include horizontal accuracy, vertical accuracy and allowed response time.

## 9.1.7 GPS Assistance Data

This parameter identifies the specific GPS assistance data that may be requested.

## 9.1.8 BSSLAP APDU

This parameter provides additional measurements (e.g. timing advance) for the target MS from the BSC. The measurements are contained inside a BSSLAP APDU.

## 9.2 BSSMAP-LE PERFORM LOCATION RESPONSE message

This message is sent in response to a BSSMAP-LE Perform Location Request to return a successful location estimate for a target MS or to indicate some failure in obtaining this. The message is also sent in response to a BSSMAP-LE Perform Location Request to return deciphering keys or an indication that LCS assistance data has been successfully delivered to an MS. The message can be sent from the SMLC to the BSC and from the SMLC to the MSC.

**Table 9.2: BSSMAP-LE PERFORM LOCATION RESPONSE message content**

Information element	Type / Reference	Presence	Format	Length in octets
Message type	Message Type	M	V	1
Location Estimate	Geographic Location	C	TLV	2-22
Positioning Data	Positioning Data	O	TLV	2-n
Deciphering Keys	Deciphering Keys	O	TLV	10-n
LCS Cause	LCS Cause	O	TLV	3

### 9.2.1 Location Estimate

This parameter provides a location estimate for the target MS in the case of a successful location attempt.

### 9.2.2 Positioning Data

This parameter provides additional information for the positioning attempt from the SMLC.

### 9.2.3 Deciphering Keys

This parameter provides one or more deciphering keys that can be used to decode LCS broadcast assistance data by the MS. The SMLC shall provide the current deciphering key for the MS's present location. The SMLC may also provide additional deciphering keys applicable either after the current deciphering key or to data broadcast by other SMLCs.

### 9.2.4 LCS Cause

The LCS Cause is included if and only if a requested location estimate was not successfully obtained (e.g. location estimate not available or does not meet the required QoS), requested deciphering keys were not successfully returned or requested LCS assistance data was not successfully transferred to the MS. The parameter provides the reason for the

failure. If the LCS Cause is included, the Location Estimate, ~~Current Deciphering Key~~ and ~~Next Deciphering Key~~ shall not be included.

## 9.3 BSSMAP-LE PERFORM LOCATION ABORT message

This message is sent by the instigator of a location request to abort the positioning attempt or the request for assistance data or deciphering keys. This message can be sent from the MSC to the SMLC and from the BSC to the SMLC.

**Table 9.3: BSSMAP-LE PERFORM LOCATION ABORT message content**

Information element	Type / Reference	Presence	Format	Length in octets
Message type	Message Type	M	V	1
LCS Cause	LCS Cause	M	TLV	3

### 9.3.1 LCS Cause

The LCS Cause provides the reason for the aborting the location attempt.

## 9.4 BSSMAP-LE LMU CONNECTION REQUEST message

This message is sent to request the establishment of a signaling connection between an LMU and an SMLC. The message can be sent from an SMLC to an MSC and from an MSC to an SMLC.

**Table 9.4: BSSMAP-LE LMU CONNECTION REQUEST message content**

Information element	Type / Reference	Presence	Format	Length in octets
Message type	Message Type	M	V	1
IMSI	IMSI	M	TLV	3-10
Sender Address	Signaling Point Code	O	TLV	2-n
Security	Security	O	TLV	2-n
Call Number	ISDN Address	O	TLV	3-n

### 9.4.1 IMSI

This parameter identifies the LMU using its E.212 IMSI.

### 9.4.2 Sender Address

This parameter provides the SS7 signaling point code for the sender of the message. The parameter is mandatory for message transfer between an MSC and SMLC on the Ls interface.

### 9.4.3 Security

This parameter indicates if authentication or ciphering are required for the LMU. This parameter may be included for message transfer from an SMLC. If the parameter is absent, authentication and ciphering shall be assumed not to be required.

## 9.4.4 Call Number

This parameter may be included in an LMU connection request sent by an MSC to enable the SMLC to subsequently establish a TCH to the LMU.

## 9.5 BSSMAP-LE LMU CONNECTION ACCEPT message

This message is sent in response to a BSSMAP-LE LMU Connection Request message to accept the establishment of a signaling connection between an LMU and an SMLC. The message can be sent from an SMLC to an MSC and from an MSC to an SMLC.

**Table 9.5: BSSMAP-LE LMU CONNECTION ACCEPT message content**

Information element	Type / Reference	Presence	Format	Length in octets
Message type	Message Type	M	V	1
Security	Security	O	TLV	3
Call Number	ISDN Address	O	TLV	3-n

### 9.5.1 Security

This parameter indicates if authentication or ciphering are required for the LMU. This parameter may be included for message transfer from an SMLC. If the parameter is absent, authentication and ciphering shall be assumed not to be required.

### 9.5.2 Call Number

This parameter may be included in an LMU connection accept sent by an MSC to enable the SMLC to subsequently establish a TCH to the LMU.

## 9.6 BSSMAP-LE LMU CONNECTION REJECT message

This message is sent in response to a BSSMAP-LE LMU Connection Request message to reject the establishment of a signaling connection between an LMU and an SMLC. The message can be sent from an SMLC to an MSC and from an MSC to an SMLC.

**Table 9.6: BSSMAP-LE LMU CONNECTION ~~REJECTREQUEST~~ message content**

Information element	Type / Reference	Presence	Format	Length in octets
Message type	Message Type	M	V	1
Reject Cause	LMU Cause	M	TLV	3-10

### 9.6.1 Reject Cause

This parameter provides the reason for the rejection of an LMU connection.

## 9.7 BSSMAP-LE LMU CONNECTION RELEASE message

This message is sent to release a signaling connection between an LMU and an SMLC. The message can be sent from an SMLC to an MSC and from an MSC to an SMLC.

**Table 9.7: BSSMAP-LE LMU CONNECTION RELEASE message content**

Information element	Type / Reference	Presence	Format	Length in octets
Message type	Message Type	M	V	1
Release Cause	LMU Cause	M	TLV	3-10

### 9.7.1 Release Cause

This parameter provides the reason for the release of an LMU connection.

## 9.8 BSSMAP-LE CONNECTION ORIENTED INFORMATION message

This message is sent in association with an existing signaling connection between an SMLC and another entity to transfer information between the SMLC and other entity belonging to a higher level protocol. The message can be sent from an SMLC to an MSC, from an MSC to an SMLC, from a BSC to an SMLC and from an SMLC to a BSC.

**Table 9.8: BSSMAP-LE CONNECTION ORIENTED INFORMATION message content**

Information element	Type / Reference	Presence	Format	Length in octets
Message type	Message Type	M	V	1
BSSLAP APDU	APDU	M	TLV	3-n

### 9.8.1 BSSLAP APDU

This parameter contains a BSSLAP message.

## 9.9 BSSMAP-LE CONNECTIONLESS INFORMATION message

This message conveys signaling information associated with a higher protocol level between an SMLC and another entity when there is no existing signaling connection association. The message can be sent from an SMLC to an MSC, from an MSC to an SMLC, from a BSC to an SMLC, from an SMLC to a BSC and from an SMLC to another SMLC..

**Table 9.9: BSSMAP-LE CONNECTIONLESS INFORMATION message content**

Information element	Type / Reference	Presence	Format	Length in octets
Message type	Message Type	M	V	1
Source Identity	Network Element Identity	M	TLV	3-n
Destination Identity	Network Element Identity	M	TLV	3-n
APDU	APDU	O	TLV	3-n
Return Error Request	Return Error Request	O	TLV	2
Return Error Cause	Return Error Cause	O	TLV	3

### 9.9.1 Source Identity

This parameter identifies the original source of the message. The original source can either be an SMLC or a Type B LMU. The source is identified by association with either a location area or a cell site.

### 9.9.2 Destination Identity

This parameter identifies the final destination of the message. The final destination can either be an SMLC or a Type B LMU. The destination is identified by association with either a location area or a cell site.

### 9.9.3 APDU

This parameter contains an embedded APDU. For information transfer between an SMLC and Type B LMU this shall be an LLP APDU. For information transfer between two peer SMLCs, this shall be an SMLCPP APDU.

### 9.9.4 Return Error Request

This parameter may be included to request an error response if BSSMAP-LE message cannot be delivered successfully to its final destination. This parameter shall not be included if the Return Error cause is present.

### 9.9.5 Return Error Cause

This parameter indicates an error response for a BSSMAP-LE connectionless information message that could not be delivered to its final destination. The APDU should be present and the same as the APDU in the original undelivered message. The source and destination identities shall be included and the same as the destination and source identities, respectively, in the original undelivered message.

\*\*\*\* Next Modified Section \*\*\*\*

## 10.2 Information Element Identifiers

The next list shows the coding of the Information Element Identifiers used in the present document.

**Table 10.2/GSM 09.31: Information Element Identifier coding**

<b>8 7 6 5 4 3 2 1</b>	<b>Information element</b>	<i>Reference</i>
0 0 1 1 1 1 1 0	LCS QoS	10.15
0 0 1 1 1 1 1 1	LCS Priority	10.14
0 1 0 0 0 0 1 1	Location Type	10.16
0 1 0 0 0 1 0 0	Geographic Location	10.8
0 1 0 0 0 1 0 1	Positioning Data	10.18
0 1 0 0 0 1 1 0	LCS Cause	10.12
0 1 0 0 0 1 1 1	LCS Client Type	10.13
0 1 0 0 1 0 0 0	APDU	10.3
0 1 0 0 1 0 0 1	Network Element Identity	10.17
0 1 0 0 1 0 1 0	GPS Assistance Data	10.9
0 1 0 0 1 0 1 1	Deciphering Keys	10.7
0 1 0 0 1 1 0 0	Return Error Request	10.19
0 1 0 0 1 1 0 1	Return Error Cause	10.20
0 0 0 1 0 0 1 1	Classmark Information Type 3	10.6
0 0 0 0 0 1 0 1	Cell Identifier	10.4
0 0 1 0 0 0 0 1	Chosen Channel	10.5
0 0 0 0 0 0 0 0	IMSI	10.10
0 0 0 0 0 0 0 1	ISDN Address	10.11



0 0 0 0 0 1 0	Security	10.21
0 0 0 0 0 1 1	Signaling Point Code	10.22

### 10.3 APDU

This is a variable length information element that conveys an embedded message or message segment associated with a higher level protocol.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octet 3</b>	S	Protocol ID						
<b>Octet 4</b> to <b>Octet n</b>	The rest of the information element contains a message whose content and encoding are defined according to the protocol ID.							

Figure 10.3.1/GSM 09.31: APDU IE

Protocol ID (bits 7-1 of octet 3)

- 0000000 reserved
- 0000001 BSSLAP
- 0000010 LLP
- 0000011 SMLCPP

S (Segmentation Bit, bit 8 of octet 3)

- 0 final segment in a segmented message or a non-segmented message or segmenting not indicated
- 1 non-final segment in a segmented message

Embedded Message (octets 4-n)

- BSSLAP the embedded message is as defined in GSM 08.71
- LLP the embedded message contains a Facility Information Element as defined in GSM 04.71 excluding the Facility IEI and length of Facility IEI octets defined in GSM 04.71.

SMLCPP the embedded message is as defined in GSM 08.31

### \*\*\* NEXT MODIFIED SECTION \*\*\*

### 10.9 GPS Assistance Data

This is a variable length information element identifying the GPS assistance data requested for an MS.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octet 3</b>	H	G	E	E	D	C	B	A
<b>Octet 4</b>	spare							
<b>Octet 3</b>	spare					Eph	ACQ	SAT
<b>Octet 54</b> to <b>Octet</b> <b>8+2n</b>	Satellite related data							

Figure 10.9.1/GSM 09.31: GPS Assistance Data IE

Octet 3bit A     Almanac0 : Almanac is not requested1 : Almanac is requestedbit B     UTC Model0 : UTC Model is not requested1 : UTC Model is requestedbit C     Ionospheric Model0 : Ionospheric Model is not requested1 : Ionospheric Model is requestedbit D     Navigation Model0 : Navigation Model is not requested – octets 5 to 8+2n are not present1 : Navigation Model is requested – octets 5 to 8+2n are presentbit E     DGPS Corrections0 : DGPS Corrections are not requested1 : DGPS Corrections are requestedbit F     Reference Location0 : Reference Location is not requested1 : Reference Location is requestedbit G     Reference Time0 : Reference Time is not requested1 : Reference Time is requestedbit H     Acquisition Assistance0 : Acquisition Assistance is not requested1 : Acquisition Assistance is requested

At least one of bits A, B, C, D, E, F, G or H, shall be set to the value “1”.

~~SAT – Satellite related data (bit 1 of octet 3)~~~~0 : Satellite related data is not requested – octets 4 to 8+2n are not present~~~~1 : Satellite related data is requested – octets 4 to 8+2n are present~~~~ACQ – Acquisition Assistance (bit 2 of octet 3)~~~~0 : Acquisition Assistance is not requested~~~~1 : Acquisition Assistance is requested~~~~Eph – Ephemeris Compression (bit 3 of octet 3)~~~~This field indicates the compression method for ephemeris update.~~~~0 : Ephemeris compression can be incorporated into requested Navigation Model information.~~~~1 : Ephemeris compression cannot be incorporated in requested Navigation Model information.~~

	8	7	6	5	4	3	2	1
<b>Octet 4</b>	H	G	F	E	D	C	B	A
<b>Octet 5</b>	GPS Week		Eph	Spare				
<b>Octet 6</b>	GPS Week							
<b>Octet 7</b>	GPS_Toe							
<b>Octet 8</b>	Spare NSAT				T-Toe limit			
<b>Octet 9</b>	spare		SatID 1					
<b>Octet 10</b>	IODE 1							
...								
<b>Octet 7+2n</b>	spare		SatID n					
<b>Octet 8+2n</b>	IODE n							

Figure 10.9.2/GSM 09.31: Coding of Satellite Related Data

**Octets 4 and 5**

- bit A — Almanac
  - 0 : Almanac is not requested
  - 1 : Almanac is requested
  
- bit B — UTC Model
  - 0 : UTC Model is not requested
  - 1 : UTC Model is requested
  
- bit C — Ionospheric Model
  - 0 : Ionospheric Model is not requested
  - 1 : Ionospheric Model is requested
  
- bit D — Navigation Model
  - 0 : Navigation Model is not requested
  - 1 : Navigation Model is requested
  
- bit E — DGPS Corrections
  - 0 : DGPS Corrections are not requested
  - 1 : DGPS Corrections are requested
  
- bit F — Reference Location
  - 0 : Reference Location is not requested
  - 1 : Reference Location is requested
  
- bit G — Reference Time
  - 0 : Reference Time is not requested
  - 1 : Reference Time is requested
  
- bit H — spare

At least one of bits A, B, C, D, E, F, or G shall be set to the value "1".

**Eph – Ephemeris Compression (bit 6 of octet 5)**

This field indicates the compression method for ephemeris update.

- 0: Ephemeris compression can be incorporated into requested Navigation Model information.
- 1: Ephemeris compression cannot be incorporated in requested Navigation Model information.

**GPS Week (bits 7-8 octet 5 and octet 6)**

This field contains a 10 bit binary representation of the GPS Week of the assistance currently held by the MS. The most significant bit of the GPS Week is bit 8 in octet 5 and the least significant bit is bit 1 in octet 6.

**GPS\_Toe (octet 7)**

This field contains a binary representation of the GPS time of ephemeris in hours of the latest ephemeris set contained in handset memory (range 0-167).

NSAT (octet 8, bits ~~5-84-7~~)

This field contains a binary representation of the number of satellites to be considered for the current GPS assistance request.

T-Toe limit (octet 8, bits 1-~~43~~)

This field contains a binary representation of the ephemeris age tolerance of the MS to the network in hours (range 0-10).

SatID x (x = 1,2, ... n) (octet 7 + 2x, bits 1-6)

This field contains a binary representation of the identity of a satellite for which the assistance request is applicable. The number of satellite fields is indicated in the field NSAT.

IODE x (x = 1,2, ... n) (octet 8 + 2x)

This field contains a binary representation of the Issue of Data Ephemeris, which identifies the sequence number for the satellite x (x = 1, 2, ..., n).

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

### 10.12 LCS Cause

The LCS Cause parameter is of variable length IE and provides the reason for an unsuccessful location request.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octet 3</b>	Cause value							
<b>Octet 4</b>	Diagnostic value (note 1)							

note 1: the inclusion of this octet depends on the cause value

**Figure 10.12.1/GSM 09.31: LCS Cause IE**

**Table 10.12.1/GSM 09.31: Cause value**

LCS Cause value (octet <u>32</u> )	
Bits	
8 7 6 5 4 3 2 1	
0 0 0 0 0 0 0 0	Unspecified
0 0 0 0 0 0 0 1	System Failure
0 0 0 0 0 0 1 0	Protocol Error
0 0 0 0 0 0 1 1	Data missing in position request
0 0 0 0 0 1 0 0	Unexpected data value in position request
0 0 0 0 0 1 0 1	Position method failure
0 0 0 0 0 1 1 0	Target MS Unreachable
0 0 0 0 0 1 1 1	Location request aborted
<u>0 0 0 0 1 0 0 0</u>	<u>Facility not supported</u>
<u>0 0 0 0 1 0 0 1</u>	<u>Inter-BSC Handover Ongoing</u>
<u>0 0 0 0 1 0 1 0</u>	<u>Congestion</u>
0 0 0 0 1 0 <u>10 10</u>	
to	<i>unspecified</i> in this version of the protocol
1 1 1 1 1 1 1 1	

Diagnostic value (octet 4): this octet may be included if the cause value indicates “position method failure”, the binary encoding of this octet shall encode the same set of values as defined for the

PositionMethodFailure-Diagnostic in GSM 09.02. Values outside those defined in GSM 09.02 shall be ignored by a receiver.

### 10.13 LCS Client Type

This information element identifies the type of LCS Client.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octet 3</b>	Client Category				Client Subtype			

**Figure 10.13.1/GSM 09.31: LCS Client Type IE**

The client category (bits 8-5 of octet 3) and the client subtype (bits 4-1 of octet 3) are coded as follows.

Client Category	Client Subtype	Explanation
0000	0000 all values	Value Added Client unspecified reserved
0010	0000 0001 0010 0011 0100 other values	PLMN operator unspecified broadcast service O&M anonymous statistics Target MS service support reserved
0011	0000 other values	Emergency services unspecified reserved
0100	0000 other values	Lawful Intercept services unspecified reserved
0101 – 1111	all values	reserved

### 10.14 LCS Priority

This information element defines the priority level of a location request.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octet 3</b>	This octet is coded as the LCS-Priority octet in GSM 09.02.							

**Figure 10.14.1/GSM 09.31: LCS Priority IE**

### 10.15 LCS QoS

This information element defines the Quality of Service for a location request.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octet 3</b>	spare							VERT
<b>Octet 4</b>	HA	Horizontal Accuracy						
<b>Octet 5</b>	VA	Vertical Accuracy						
<b>Octet 6</b>	RT		spare					

**Figure 10.15.1/GSM 09.31: LCS QoS-Cell Identifier IE**

Octet 3

VERT = vertical coordinate indicator  
 0 : vertical coordinate not requested  
 1 : vertical coordinate is requested

Octet 4

bit 8 HA = horizontal accuracy indicator  
 0 : Horizontal Accuracy is not specified  
 1 : Horizontal Accuracy is specified  
 bits 7-1 Horizontal Accuracy :  
 spare (set all zeroes) if HA=0  
 set to 7 bit uncertainty code in GSM 03.32 if HA=1

Octet 5 – applicable only if VERT = 1

bit 8 VA = vertical accuracy indicator  
 0 : Vertical Accuracy is not specified  
 1 : Vertical Accuracy is specified  
 bits 7-1 Vertical Accuracy :  
 spare (set all zeroes) if VA=0  
 set to 7 bit uncertainty altitude code in GSM 03.32 if VA=1

Octet 6

bits 8-7 RT = response time category  
 00 : Response Time is not specified  
 01 : Low Delay  
 10 : Delay Tolerant  
 11 : reserved  
 bits 6-1 spare

## 10.16 Location Type

This is a variable length information element defining the type of location information being requested.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octet 3</b>	Location Information							
<b>Octet 4</b>	Positioning Method							

**Figure 10.16.1/GSM 09.31: Location Type IE**

Coding of location information (octet 3):

00000000 current geographic location  
 00000001 location assistance information for the target MS  
 00000010 deciphering keys for broadcast assistance data for the target MS  
 all other values are reserved

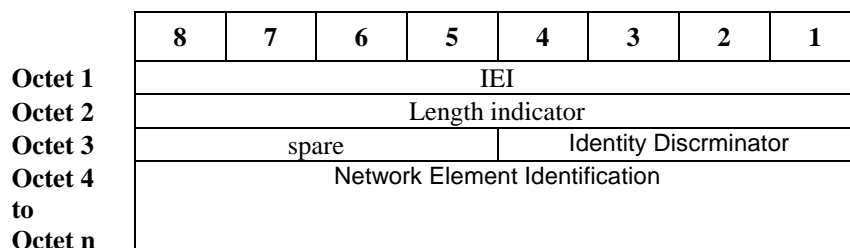
Positioning Method (octet 4)

This octet shall be included if the location information in octet 3 indicates “location assistance information for the target MS” and shall be omitted otherwise.

00000000 reserved  
 00000001 Mobile Assisted E-OTD  
 00000010 Mobile Based E-OTD  
 00000011 GPS  
 all other values are reserved

## 10.17 Network Element Identity

This is a variable length information element identifying a network element, by association with either a designated cell site or a designated location area.



**Figure 10.17.1/GSM 09.31: Network Element Identity IE**

Identity Discriminator (bits 4-1 of octet 3)

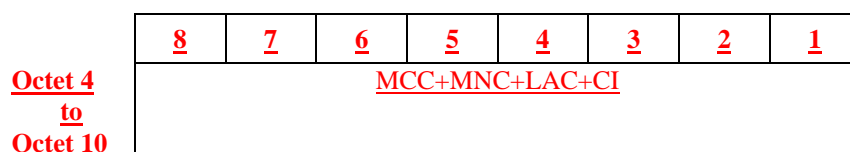
0000 Identification using the MCC + MNC + LAC + CI as defined in GSM 03.03

0001 Identification using LAC + CI as defined in GSM 03.03

0100 Identification using the MCC + MNC + LAC as defined in GSM 03.03

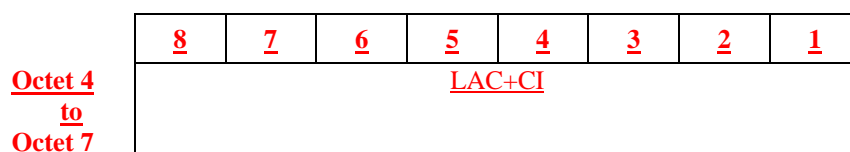
0101 Identification using the LAC as defined in GSM 03.03

All other values are reserved.



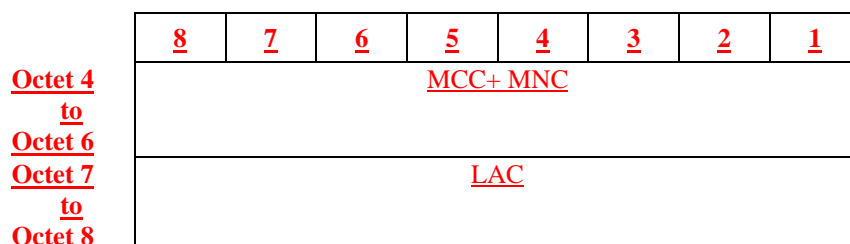
**Figure 10.17.1/GSM 09.31: Coding of Network Element Identification using the MCC + MNC + LAC + CI**

Octets 4 to 10 are coded as the Cell Identification of the Cell Identifier IE for Cell identification discriminator = 0000 defined in GSM 08.08.



**Figure 10.17.2/GSM 09.31: Coding of Network Element Identification using the LAC + CI**

Octets 4 to 7 are coded as the Cell Identification of the Cell Identifier IE for Cell identification discriminator = 0001 defined in GSM 08.08.



**Figure 10.17.3/GSM 09.31: Coding of Network Element Identification using the MCC + MNC + LAC**

Octets 4 to 8 are coded as the corresponding octets in the Cell Identification of the Cell Identifier List IE for Cell identification discriminator = 0100 defined in GSM 08.08.

	8	7	6	5	4	3	2	1
Octet 4	LAC							
Octet 5	LAC - continued							

Figure 10.17.24/GSM 09.31: Coding of Network Element Identification using the LAC

Octets 4 to 5 are coded as the corresponding octets in the Cell Identification of the Cell Identifier List IE for Cell identification discriminator = 0101 defined in GSM 08.08.

	8	7	6	5	4	3	2	1
Octet 4	LAC							
Octet 5	LAC - continued							
Octet 6	CI value							
Octet 7	CI value - continued							

Figure 10.17.3/GSM 09.31: Coding of Network Element Identification using the LAC + CI

### 10.18 Positioning Data

This is a variable length information element providing positioning data associated with a successful or unsuccessful location attempt for a target MS.

	8	7	6	5	4	3	2	1
Octet 1	IEI							
Octet 2	Length indicator							
Octet 3	spare				Positioning Data Discriminator			
Octets 4-4+m	Positioning Method 1							
Octets ..-4+nm	Positioning Method n							

Figure 10.18.1/GSM 09.31: Positioning Data IE

The positioning data discriminator (bits 4-1 of octet 3) defines the type of data provided for each positioning method:

0000 indicate usage of each positioning method that was attempted either successfully or unsuccessfully  
all other values are reserved

Coding of the positioning method octets for positioning data discriminator = 0:

Octet x	positioning method	usage
---------	--------------------	-------

Coding of positioning method (bits 8-4):

- 00000 Timing Advance
- 00001 TOA
- 00010 AOA
- 00011 Mobile Assisted E-OTD
- 00100 Mobile Based E-OTD
- 00101 Mobile Assisted GPS
- 00110 Mobile Based GPS
- 00111 Conventional GPS
- 01000
- to reserved for GSM
- 01111
- 10000
- to reserved for network specific positioning methods
- 11111



Coding of usage (bits 3-1)

- 000 Attempted unsuccessfully due to failure or interruption
- 001 Attempted successfully: results not used to generate location
- 010 Attempted successfully: results used to verify but not generate location
- 011 Attempted successfully: results used to generate location
- 100 Attempted successfully: case where MS supports multiple mobile based positioning methods and the actual method or methods used by the MS cannot be determined

## 10.19 Return Error Request

The Return Error Request parameter indicates a request from the source of a BSSMAP-LE connectionless information message for an error response if the message cannot be delivered to its final destination.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							

Figure 10.19.1/GSM 09.31: Return Error Request IE

## 10.20 Return Error Cause

The Return Error Cause parameter provides the reason for unsuccessful delivery of a BSSMAP-LE Connectionless Information message to its final destination.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octet 3</b>	Cause value							

Figure 10.20.1/GSM 09.31: Return Error Cause IE

Table 10.20.1/GSM 09.31: Cause value

Cause value (octet <del>32</del> )	
Bits	
8 7 6 5 4 3 2 1	
0 0 0 0 0 0 0 0	Unspecified
0 0 0 0 0 0 0 1	System Failure
0 0 0 0 0 0 1 0	Protocol Error
0 0 0 0 0 0 1 1	Destination unknown
0 0 0 0 0 1 0 0	Destination unreachable
0 0 0 0 0 1 0 1	Congestion
0 0 0 0 0 1 1 0	
to	<i>unspecified</i> in this version of the protocol
1 1 1 1 1 1 1 1	

## 10.21 Security

This information element defines what security measures are needed for signaling to an LMU.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octet 3</b>	spare						CIPH	AUTH

**Figure 10.21.1/GSM 09.31: Security IE**

Coding of octet 3:

- bit 1 AUTH = authentication indicator  
 0 : authentication of LMU not required  
 1 : authentication of LMU required
  
- bit 2 CIPH = ciphering indicator  
 0 : ciphering of LMU signaling data not required  
 1 : ciphering of LMU signaling data required

## 10.22 Signaling Point Code

This is a variable length information element providing that provides the signaling point code of a network element.

	8	7	6	5	4	3	2	1
<b>Octet 1</b>	IEI							
<b>Octet 2</b>	Length indicator							
<b>Octets 3-n</b>	Signaling Point Code value							

**Figure 10.22.1/GSM 09.31: Signaling Point Code IE**

There are three options for the coding of Signaling Point Code value; 2 octets containing a 14 bit ITU code, 3 octets containing a 24 bit unstructured code and 3 octets containing a 24 bit ANSI structured code.

Encoding of 14 bit ITU signaling point code:

<b>Octet 3</b>	0	0	signaling point code (high order bits)
<b>Octets 4</b>	signaling point code (low order bits)		

Encoding of a 24 bit unstructured signaling point code:

<b>Octet 3</b>	signaling point code (high order octet)
<b>Octet 4</b>	signaling point (second octet)
<b>Octets 5</b>	signaling point code (low order octet)

Encoding of a 24 bit ANSI structured signaling point code:

<b>Octet 3</b>	Network Identifier
<b>Octet 4</b>	Network Cluster
<b>Octets 5</b>	Network Cluster Member