Mobile Location Protocol

Candidate Version 3.5 – 11 Dec 2018

Open Mobile Alliance

OMA-TS-MLP-V3_5-20181211-C

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1. Scope

The Mobile Location Protocol (MLP) is an application-level protocol for getting the position of mobile stations (mobile phones, wireless personal digital assistants, etc.) independent of underlying network technology, i.e. independent of location derivation technology and bearer as described in [MLS AD]. The MLP serves as the interface between a Location Server and a MLS Client. This specification defines the core set of operations that a Location Server should be able to perform.

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3. Terminology and Conventions

3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope" and “Introduction” are normative, unless they are explicitly indicated to be informative.

Notational Conventions and Generic Grammar

The following rules are used throughout this specification to describe basic parsing constructs.

- ANSI X3.4-1986 defines the US-ASCII coded character set, see [ASCII]

CR	= <US-ASCII CR, carriage return (13)>
LF	= <US-ASCII LF, linefeed (10)>
SP	= <US-ASCII SP, space (32)>

- A set of characters enclosed in brackets ([...]) is a one-character expression that matches any of the characters in that set, e.g., "[lcs]" matches either an "l", "c", or "s". A range of characters is indicated with a dash, e.g., "[a-z]" matches any lower-case letter.
- The one-character expression can be followed by an interval operator, for example [a-zA-Z]{min,max} in which case the one-character expression is repeated at least min and at most max times, e.g., "[a-zA-Z]{2,4}" matches for example the strings "at", "Good", and "biG".

DTD Syntax Notation

The table below describes the special characters and separators used in the DTDs defining the different services.

Character	Meaning
+	One or more occurrence
*	Zero or more occurrences
?	Optional
(...)	A group of expressions to be matched together
|	OR...as in, "this or that"
,	Strictly ordered. Like an AND

3.2 Definitions

Access Location Network	A network that can be used for localization.
Le	Reference point between MLS Client and Location Server. See also [23.271]
Location Server	Software and/or hardware entity offering location capabilities.
Target	The entity being located.
Timing Advance	Parameter in GSM network used by the MS to advance its timings of transmissions to the Base Station so as to compensate for propagation delay. This parameter can also be used to estimate the distance between the MS and the Base Station.

3.3 Abbreviations

AFLT	Advanced Forward Link Triangulation positioning method
A-GPS	Assisted GPS
ALN	Access Location Network
ANSI	American National Standards Institute

APN	Access Point Name
ASID	Anonymous Subscriber Identity
ASP	Application Service Provider
BDS	BeiDou Navigation Satellite System
BT	Bluetooth
CRS	Coordinate Reference System
DMSH	Degrees Minutes Seconds Hemisphere
DTD	Document Type Definition
EFLT	Enhanced Forward Link Triangulation positioning method
E-OTD	Enhanced Observed Time Difference (E-OTD)
ESRK	Emergency Services Routing Key
GANSS	Galileo and Additional Global Navigation Satellite Systems
GEM	General Error Message
GLONASS	GLObal'naya NAvigatsionnaya Sputnikovaya Sistema
GML	Geography Markup Language
GMLC	Gateway Mobile Location Center
GMT	Greenwich Mean Time
GNSS	Global Navigation Satellite Systems
GPS	Global Positioning System
HLR	Home Location Register
HTTP	Hypertext Transfer Protocol
HTTPS	HTTP Secure
IMSI	International Mobile Station Identifier
LCS	Location Services
MBS	Metropolitan Beacon System
MLC	Mobile Location Center
MLP	Mobile Location Protocol
MPC	Mobile Positioning Center
MS	Mobile Station
MSID	Mobile Station Identifier
MSISDN	Mobile Station ISDN
NAI	Network Access Identifier
OTDOA	Observed Time Difference of Arrival
QZSS	Quasi-Zenith Satellite System
SBAS	Satellite Based Augmentation System
SOAP	Simple Object Access Protocol
SSL	Secure Socket Layer
TLS	Transport Layer Security
URI	Uniform Resource Identifier
URL	Uniform Resource Locator

U-TDOA	Uplink Time Difference of Arrival
UTM	Universal Transverse Mercator
WAP	Wireless Application Protocol
WGS	World Geodetic System
WLAN	Wireless Local Area Network
WSP	Wireless Session Protocol
XML	Extensible Markup Language

4. Introduction

The Mobile Location Protocol (MLP) is an application-level protocol for getting the position of mobile stations (mobile phones, wireless personal digital assistants, etc.) independent of underlying network technology, i.e. independent of location derivation technology and bearer. The MLP serves as the interface between a Location Server and a MLS (Mobile Location Service) Client. This specification defines the core set of operations that a Location Server should be able to perform. The purpose of this specification is to specify the detailed technical specification of the interface between a Location Server and a MLS Client described in [MLS AD]. In the 3GPP context, this specification will be an instantiation of the detailed technical specifications for the Le reference point as defined in [23.271].

4.1 Version 3.0

MLP V3.0 do not exist as an OMA specification. However the specification LIF TS 101 V3.0.0 that was created by the OMA affilitate Location Interoperability Forum (LIF) is the baseline for the evolution of MLP.

4.2 Version 3.1

MLP V3.1 is the first version published by OMA. Relative LIF TS 101 V3.0.0 is includes bug fixes and editorial corrections but no added features.

4.3 Version 3.2

The main enhancement in MLP V3.2 is to align with the 3GPP Release 6 LCS Specification. One example of enhancement is introduction of Area Event trigger.

4.4 Version 3.3

The main enhancement in MLP V3.3 is to align with the 3GPP Release 7 LCS Specification and OMA SUPL 2.0. Examples of enhancements are historic location reporting, intermediate location reporting, support of civic location format and support of map data.

4.5 Version 3.4

The main enhancement in MLP V3.4 is to align with the 3GPP Release 10 LCS Specification, OMA SUPL 3.0 and OMA LPPe V1.0. Examples of enhancements are trigger pause resume, trigger query and velocity trigger.

4.6 Version 3.5

The main enhancement in MLP V3.5 is to align with the support of Indoor Location Alliance use cases and addition of possibility for MLS Client to indicate supported shapes.

5. Mobile Location Protocol

5.1 Overview

The Mobile Location Protocol (MLP) is an application-level protocol for querying the position of mobile stations independent of underlying network technology. The MLP serves as the interface between a Location Server and a location-based application (cf. Figure 1).

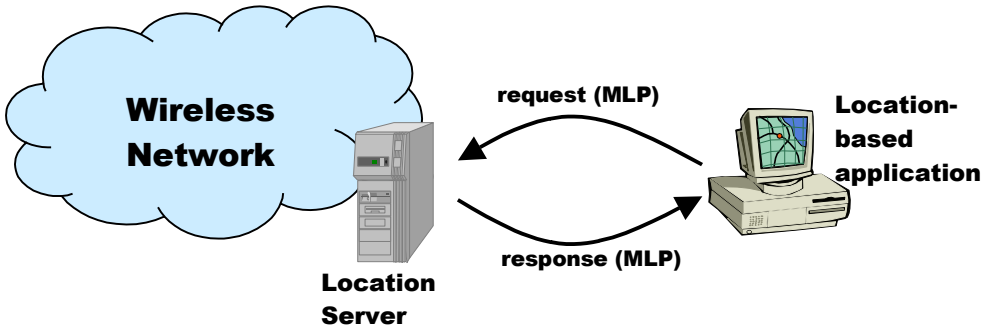

Figure 1: MLP in the context of the LCS Architecture

Possible realisations of a Location Server are the GMLC, which is the location server defined in GSM and UMTS, and the MPC, which is defined in ANSI standards. Since the location server should be seen as a logical entity, other implementations are possible.

In the scenarios (except where explicitly mentioned) an LCS client initiates the dialogue by sending a query to the location server and the server responds to the query.

5.1.1 MLP structure

Different devices may support different means of communication. A ubiquitous protocol for location services should support different transport mechanisms.

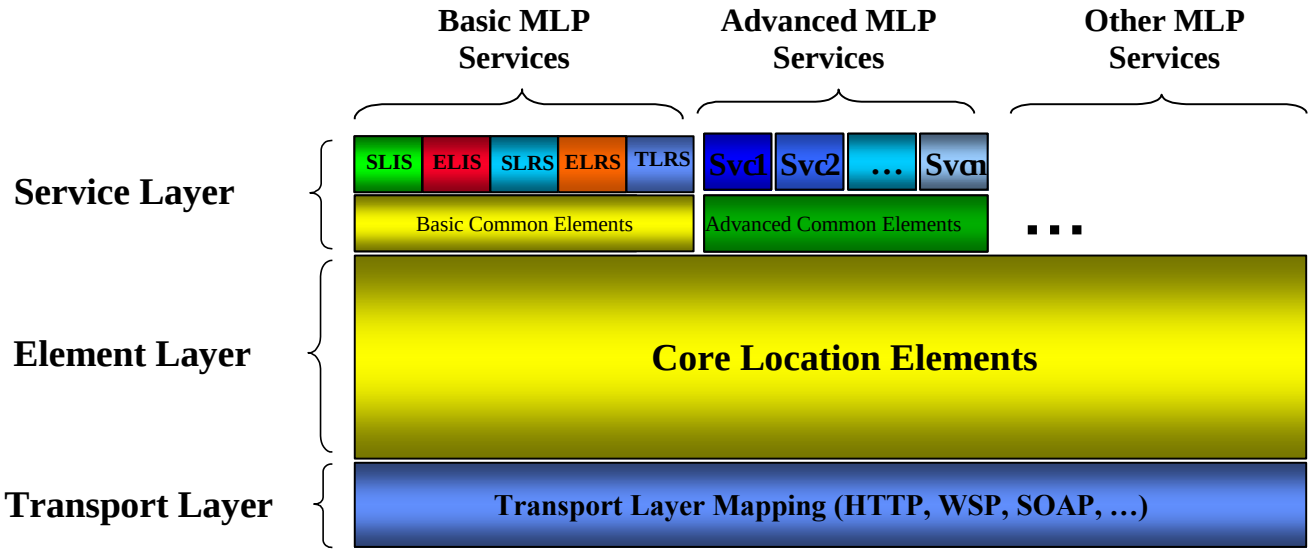

Figure 2: MLP Structure

In MLP, the transport protocol is separated from the XML content. Figure 2 shows a layered view of MLP.

On the lowest level, the transport protocol defines how XML content is transported. Possible MLP transport protocols include HTTP, WSP, SOAP and others.

The Element Layer defines all common elements used by the services in the service layer. Currently MLP defines the following set of DTDs making up the element layer of MLP:

MLP.DTD	Element Definitions specific for MLP
MLP_ID_QOP_RES_SHAPE.DTD	Element Definitions common with RLP

The Service Layer defines the actual services offered by the MLP framework. Basic MLP Services are based on location services defined by 3GPP, and are defined by this specification. The "Advanced MLP Services" and "Other MLP Services" are additional services that either will be specified in other specifications or are specified by other fora that conform to the MLP framework.

Note: The boxes representing services in the Service Layer may contain more than one message. E.g. SLIS (Standard Location Immediate Service) consists of slir (Standard Location Immediate Request), slia (Standard Location Immediate Answer) and slirep (Standard Location Immediate Report) messages. Messages for each service are listed in the table below.

The Service Layer is divided into two sub-layers. The topmost defines the services mentioned in the previous paragraph. The lower sub-layer holds common elements, which are specific for that group of services. If an element is common to more than one group of services then that element is defined in the element layer. The present specification specifies no element sub-layer.

There are a number of different possible types of location services. Each implementation of location server can select which services it wants/needs to support. The services are described in the table below.

Service	**Description**
Standard Location Immediate Service	This is a standard query service with support for a large set of parameters. This service is used when a (single) location response is required immediately (within a set time) or the request may be served by several asynchronous location responses (until a predefined timeout limit is reached). This service consists of the following messages: - Standard Location Immediate Request - Standard Location Immediate Answer - Standard Location Immediate Report
Emergency Location Immediate Service	This is a service used especially 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) or the request may be served by several asynchronous location responses. This service consists of the following messages: - Emergency Location Immediate Request - Emergency Location Immediate Answer - Emergency Location Immediate Report
Standard Location Reporting Service	This is a service that is used when a mobile subscriber wants an LCS Client to receive the MS location. The position is sent to the LCS Client from the location server. Which LCS application and its address are specified by the MS or defined in the location server. This service consists of the following message: - Standard Location Report - Standard Location Report Answer
Emergency Location Reporting Service	This is a service that is used when the wireless network automatically initiates the positioning at an emergency call. The position and related data is then sent to the emergency application from the location server.

	Which LCS application and its address are defined in the location server. This service consists of the following message: - Emergency Location Report
Triggered Location Reporting Service	This is a service used when the mobile subscriber's location should be reported at a specific time interval or on the occurrence of a specific event. This service consists of the following messages: - Triggered Location Reporting Request - Triggered Location Reporting Answer - Triggered Location Report - Triggered Location Reporting Stop Request - Triggered Location Reporting Stop Answer - Triggered Location Reporting Pause Report - Triggered Location Reporting Query Request - Triggered Location Reporting Query Answer - Triggered Location Query Report

5.1.2 MLP extension mechanism

The MLP specification has been designed with extensibility in mind. Examples of design principles employed to achieve this include:

- Separate DTDs for definitions that are common to all messages, e.g. client address and shapes, so they can be re-used.
- A message extension mechanism allowing the addition of new messages (specific for the HTTP mapping). This mechanism works by specifying an entity parameter, '%extension;', referring to an extension DTD. The extension DTD MUST contain another entity parameter, '%extension.message', containing the definition of the extension as a string together with the actual parameters being added
- A parameter extension mechanism allowing the addition of new parameters to existing messages. This mechanism works by specifying an entity parameter, '%extension;', referring to an extension DTD. The extension DTD MUST contain another entity parameter, '%extension.param', containing the definition of the extension as a string together with the actual messages being added.
- Each extension parameters SHOULD have a vendor specific prefix in order to guarantee their uniqueness.
- Element names defined in MLP SHALL NOT be reused with a different definition.

In order to use the extension, the extension DTD has to be explicitly referenced in the XML document.

The Location Server SHOULD ignore any extension that is not recognized and process the message as if the extension is not available.

Example 1: Message extension

```
<!-- truckco_MLP_extension -->

<!ENTITY    % extension.message                                    "| truckco_message">

<!ELEMENT   truckco_message                                       (truckco_data)>
<!ATTLIST   truckco_message
            ver CDATA                                             #FIXED "x.y.z">
```

```
<?xml version = "1.0" ?>
<!DOCTYPE svc_init SYSTEM "MLP_SVC_INIT_320.DTD " [
  <!ENTITY % extension SYSTEM
      "http://www.truckco.com/truckco_MLP_extension.dtd">
  %extension;
]>
<svc_init ver="3.5.0">
  <hdr ver="3.5.0">
    ...
  </hdr>
```

```
    <truckco_message ver="x.y.z">
      <truckco_data>
        ...
      </truckco_data>
    </truckco_message>
  </svc_init>
```

Example 2: Parameter extension (note that "trucko_codeword" is given with a vendor specific prefix as the element "codeword" has a different definition than in MLP)

```
<!-- truckco_MLP_extension -->

<!ENTITY    % extension.param                                    ", truckco_extension">

<!ELEMENT   trucko_extension                                    (truck_no, trucko_codeword)>
<!ELEMENT   truck_no                                            (#PCDATA)>
<!ELEMENT   trucko_codeword                                     (#PCDATA)>
<!ATTLIST   trucko_codeword
            type ( long | short)                                #REQUIRED>
```

```
  <?xml version = "1.0" ?>
  <!DOCTYPE svc_init SYSTEM "MLP_SVC_INIT_320.DTD" [
    <!ENTITY % extension SYSTEM
        "http://www.truckco.com/truckco_MLP_extension.dtd">
    %extension;
  ]>
  <svc_init ver="3.5.0">
    <hdr ver="3.5.0">
      ...
    </hdr>
    <slir ver="3.5.0">
      ...
      <truckco_extension>
        <truck_no>KLM4583</truck_no>
           <trucko_codeword  type=”short”>6547</trucko_codeword>
      </truckco_extension>
    </slir>
  </svc_init>
```

5.2 Mobile Location Service Definitions

5.2.1 Transport Protocol Layer Definitions

MLP can be implemented using various transport mechanism as stated in section 5.1.1. The following mappings are specified for MLP:

Mapping	Section
HTTP	1.1 HTTP Mapping

5.2.2 Element Layer Definitions

5.2.2.1 Identity Element Definitions

```
<!-- MLP_ID -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_xxx PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_xxx>
      ...
   </svc_xxx>

Terms and conditions of use are available from the
Open Mobile Alliance Ltd. web site at
http://www.openmobilealliance.org/
-->

<!ELEMENT   msid                                              (#PCDATA)>
<!ATTLIST   msid
            type (MSISDN | IMSI | IMEI | MIN | MDN |          "MSISDN"
                  EME_MSID | ASID | OPE_ID | IPV4 | IPV6 |
                  SESSID | SIP_URI |TEL_URL | NAI | URI |
                  ANONYMOUS | VENUE_ID | LOCATION_ID)
            enc (ASC | CRP)                                   "ASC">
<!ELEMENT   msid_range                                        (start_msid, stop_msid)>
<!ELEMENT   msids                                             (((msid, codeword?, session?,
                                                              trans_id?) | (msid_range,
                                                              codeword*)| msid_group)+)>
<!ELEMENT   msid_group                                        (#PCDATA)>
<!ATTLIST   msid_group
            type (NONE | UNSPECIFIED | REGISTERED |          "UNSPECIFIED">
                  UNREGISTERED | VENUE)
<!ELEMENT   codeword                                          (#PCDATA)>
<!ELEMENT   esrd                                              (#PCDATA)>
<!ATTLIST   esrd
            type (NA | LOCAL)                                 "NA">
<!ELEMENT   esrk                                              (#PCDATA)>
<!ATTLIST   esrk
            type (NA | LOCAL)                                 "NA">
<!ELEMENT   session                                           (#PCDATA)>
<!ATTLIST   session
            type (APN | DIAL)                                 #REQUIRED>
<!ELEMENT   start_msid                                        (msid)>
<!ELEMENT   stop_msid                                         (msid)>
<!ELEMENT   trans_id                                          (#PCDATA)>
```

Note: The type attributes of the msid elements that form the start_msid and stop_msid elements MUST be the same.

5.2.2.2 Function Element Definitions

```
<!-- MLP_FUNC -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_init PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_init>
      ...
   </svc_init>

Terms and conditions of use are available from the
Open Mobile Alliance Ltd. web site at
http://www.openmobilealliance.org/
-->


<!ELEMENT   eme_event                                          (eme_pos+)>
<!ATTLIST   eme_event
            eme_trigger (EME_ORG | EME_REL | EME_HO)           #REQUIRED>
<!ELEMENT   tlrr_event                                         ((ms_action | change_area |
                                                               velocity_event | distance_event |
                                                               equidistance_event | aln_event),
                                                               group_condition?, persistence?)>
<!ELEMENT   analytic_report                                    (target_area | aln)>
<!ELEMENT   ms_action                                          EMPTY>
<!ATTLIST   ms_action
            type (MS_AVAIL)                                    #REQUIRED>
<!ELEMENT   change_area                                        (target_area, no_of_reports?,
                                                               minimumIntervalTime?)>
<!ATTLIST   change_area
            type (MS_ENTERING | MS_LEAVING | MS_WITHIN_AREA |   #REQUIRED
            MS_OUTSIDE_AREA)
            loc_estimates (TRUE | FALSE)                       #REQUIRED>
<!ELEMENT   velocity_event                                     (target_speed, no_of_reports?,
                                                               minimumIntervalTime?)>
<!ATTLIST   velocity_event
            type (INCREASING_ABOVE | ABOVE | DECREASING_BELOW  #REQUIRED
            | BELOW)
            vel_estimates (TRUE | FALSE)                       #REQUIRED>
<!ELEMENT   distance_event                                     (target_distance,reference_object+,
                                                               no_of_reports?,
                                                               minimumIntervalTime?)>
<!ATTLIST   distance_event
            type (ENTERING_DISTANCE | LEAVING_DISTANCE |       #REQUIRED
            WITHIN_DISTANCE | OUTSIDE_DISTANCE)
            loc_estimates (TRUE | FALSE)                       #REQUIRED>
<!ELEMENT   equidistance_event                                 (target_equidistance,
                                                               no_of_reports?,
                                                               minimumIntervalTime?)>
<!ATTLIST   equidistance_event
            loc_estimates (TRUE | FALSE)                       #REQUIRED>
<!ELEMENT   aln_event                                          (aln, no_of_reports?,
                                                               minimumIntervalTime?)>
<!ATTLIST   aln_event
```

```
            type (MS_ENTERING | MS_LEAVING | MS_WITHIN_AREA)    #REQUIRED
            loc_estimates (TRUE | FALSE)                        #REQUIRED>
<!ELEMENT   aln                                                 (aln_id?, aln_name?,
                                                                aln_node_set?)>
<!ELEMENT   aln_id                                              (#PCDATA)>
<!ATTLIST   aln_id
            type (SSID | BSSID | OTHER)                         #REQUIRED>
<!ELEMENT   aln_name                                            (#PCDATA)>
<!ELEMENT   aln_node_set                                        (aln_node+)>
<!ELEMENT   aln_node                                            (#PCDATA)>
<!ATTLIST   aln_node
            type (WIFI | BT | SRN | OTHER)                      #REQUIRED
            id_type (MAC_ADDRESS | OTHER)                       #REQUIRED>
<!ELEMENT   target_area                                         (shape | (shape, civicloc) |
                                                                civicloc | cc | plmn | name_area)>
<!ELEMENT   target_speed                                        (speed)>
<!ELEMENT   target_distance                                     (#PCDATA)>
<!ELEMENT   target_equidistance                                 (#PCDATA)>
<!ELEMENT   reference_object                                    (msid)>
<!ELEMENT   no_of_reports                                       (#PCDATA)>
<!ELEMENT   minimumIntervalTime                                 (#PCDATA)>
<!ELEMENT   name_area                                           (#PCDATA)>
<!ELEMENT   plmn                                                (mcc, mnc)>
<!ELEMENT   interval                                            (#PCDATA)>
<!ELEMENT   loc_type                                            (batch_cond?)>
<!ATTLIST   loc_type
            type (CURRENT | LAST |CURRENT_OR_LAST |             "CURRENT"
            LAST_OR_CURRENT | INITIAL |
            CURRENT_AND_INTERMEDIATE | LOCATION_URI)
            per_type (REALTIME | QUASIREALTIME | BATCH)         "REALTIME">
<!ELEMENT   batch_cond                                          (#PCDATA)>
<!ATTLIST   batch_cond
            batch_type (MEASUREMENTS | MINUTES | ENDOFSERVICE   "ENDOFSERVICE">
            )
<!ELEMENT   prio                                                EMPTY>
<!ATTLIST   prio
            type (NORMAL | HIGH)                                "NORMAL">
<!ELEMENT   pushaddr                                            (url, id?, pwd?)>
<!ELEMENT   req_id                                              (#PCDATA)>
<!ELEMENT   start_time                                          (#PCDATA)>
<!ATTLIST   start_time
            utc_off CDATA                                       "0000">
<!ELEMENT   stop_time                                           (#PCDATA)>
<!ATTLIST   stop_time
            utc_off CDATA                                       "0000">
<!ELEMENT   duration                                            (#PCDATA)>
<!ELEMENT   url                                                 (#PCDATA)>
<!ELEMENT   time_remaining                                      (#PCDATA)>
<!ELEMENT   lcs_ref                                             (#PCDATA)>
<!ELEMENT   supl_support_params                                 (ip_address?, shape?)>
<!ELEMENT   ip_address                                          (#PCDATA)>
<!ELEMENT   trigger_data                                        (req_id, msid+, tlrr?)>
<!ELEMENT   target_serving_node                                 (vmscid | (mme_name,
                                                                diameter_realm?) | sgsnid |
                                                                (sgsn_name, diameter_realm?) |
                                                                Amf name)>
<!ELEMENT   mme_name                                            (#PCDATA)>
<!ELEMENT   sgsnid                                              (cc?, ndc?, sgsnno)>
<!ELEMENT   sgsnno                                              (#PCDATA)>
<!ELEMENT   sgsn_name                                           (#PCDATA)>
<!ELEMENT   diameter_realm                                      (#PCDATA)>
```

```
<!ELEMENT   amf_name                                        (#PCDATA)>
<!ELEMENT   query_id                                        (#PCDATA)>
<!ELEMENT   locationserver_address                          (url)>
<!ELEMENT   group_condition                                 (#PCDATA)>
<!ATTLIST   group_condition
            threshold_type (ALL | MINIMUM | MAXIMUM)        "ALL"
            value_type (RELATIVE | ABSOLUTE)                "ABSOLUTE">
<!ELEMENT   persistence                                     (#PCDATA)>
```

The following rules apply to trigger events (tlrr_event):

change_area: a report is triggered when the MS either (1) enters, (2) leaves, (3) is within or (4) is outside the target area (target_area).

velocity_event: a report is triggered when the MS's speed either (1) increases above, (2) is above, (3) decreases below or (4) is below the target speed (target_speed).

distance_event: a report is triggered when the MS's distance from a reference object (e.g., another MS) either (1) decreases below the target_distance, (2) increases above the target_distance, (3) is below the target_distance or (4) is above the target distance (target_distance).

equidistance_event: a report is triggered when the MS has moved by a defined distance (target_equidistance).

aln_event: a report is triggered when the MS either (1) enters, (2) leaves or (3) is within the coverage area of an ALN (aln).

In all the above scenarios:

1. The optional parameter "no_of_reports" defines how many times the location server may report the occurrence of a trigger event within the trigger session. If the maximum number of reports is reached, the trigger session is deemed complete.

2. The optional parameter "minimumIntervalTime" may be used to define a minimum back-off time after a trigger event was detected. Occurrence of the trigger is either not detected or, if detected, is ignored during the minimum interval after which the server resumes detection of the trigger.

3. The attribute "loc_estimates" determines whether or not the location of the MS needs to be reported as part of the trigger event report.

The optional parameter "persistence" defines for how long a trigger event condition must have been continuously met before a trigger report is sent. This parameter applies to all trigger events.

The optional parameters "persistence" and "minimumIntervalTime" should not both be present. When both are present, the parameter with higher value takes precedence and the other shall be ignored. When both are present with equal values, a server may choose which parameter to support and which to ignore.

Analytic reports can be used to collect statistical data (e.g. mean and standard deviation) about the number and dwell time of patrons (or visitors) visiting a target area (e.g. a store, a museum, a government office).The target area is described as either a geographical area (target_area) or an Access Location Network (aln). While the target_area parameter defines the target area in direct geographic terms, the aln parameter defines the target area indirectly through the radio coverage of the Access Location Network.

5.2.2.3 Location Element Definitions

```
<!-- MLP_LOC -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_xxx PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_xxx>
      ...
   </svc_xxx>

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-->


<!ELEMENT   pos                                              (msid, (pd | location_uri |
                                                             poserr),
                                                              gsm_net_param?,
                                                             trans_id?,add_info?,
                                                             positioning_data*)>
<!ATTLIST   pos
            pos_method (CELL | OTDOA | GPS | A-GPS | GNSS |   #IMPLIED
            A-GNSS | E-OTD | U-TDOA | AFLT | EFLT | E-CID |
            BARO | BT | MBS | WLAN | UNKNOWN | OTHER)
            result_type (INTERMEDIATE | FINAL)               "FINAL">
<!ELEMENT   eme_pos                                          (msid+, (pd | location_uri |
                                                             poserr)?, esrd?,
                                                              esrk?, trans_id?, serving_cell?,
                                                             target_serving_node?, location_id?,
                                                             positioning_data*)>
<!ATTLIST   eme_pos
            pos_method (CELL | OTDOA | GPS | A-GPS | GNSS |   #IMPLIED
            A-GNSS | E-OTD | U-TDOA | AFLT | EFLT | E-CID |
            BARO | BT | MBS | WLAN | UNKNOWN | OTHER)
            result_type (INTERMEDIATE | FINAL)               "FINAL">
<!ELEMENT   trl_pos                                          (msid?, reference_object*, (pd |
                                                             poserr | time | analytic_data),
                                                             positioning_data*)>
<!ATTLIST   trl_pos
            trl_trigger (PERIODIC | MS_AVAIL | CHANGE_AREA   #REQUIRED
            | VELOCITY | DISTANCE | EQUIDISTANCE |
            ALN_EVENT)
            pos_method (CELL | OTDOA | GPS | A-GPS | GNSS |   #IMPLIED>
            A-GNSS | E-OTD | U-TDOA | AFLT | EFLT | E-CID |
            BARO | BT | MBS | WLAN | UNKNOWN | OTHER)
<!ELEMENT   positioning_data                                 EMPTY>
<!ATTLIST   positioning_data
            positioning_method (CELL | OTDOA | GPS | A-GPS   #IMPLIED
            | GNSS | A-GNSS | E-OTD | U-TDOA | AFLT | EFLT
            | E-CID | BARO | BT | MBS | WLAN | OTHER |
            UNKNOWN)
            positioning_mode (UE-BASED | UE-ASSISTED |       #IMPLIED
            CONVENTIONAL)
            ganss_id (GALILEO | SBAS | MODERNIZED-GPS |      #IMPLIED>
```

```
            QZSS | GLONASS | BDS | UNKNOWN | OTHER)
<!ELEMENT   analytic_data                                   (time, num_of_ms, dwell_time?)>
<!ELEMENT   num_of_ms                                       (num_start?, num_entered, num_left,
                                                            num_mean?, num_std_dev?)>
<!ELEMENT   dwell_time                                      (mean_dwell_time,
                                                            dwell_time_std_dev?)>
<!ELEMENT   num_start                                       (#PCDATA)>
<!ELEMENT   num_entered                                     (#PCDATA)>
<!ELEMENT   num_left                                        (#PCDATA)>
<!ELEMENT   num_mean                                        (#PCDATA)>
<!ELEMENT   num_std_dev                                     (#PCDATA)>
<!ELEMENT   mean_dwell_time                                 (duration)>
<!ELEMENT   dwell_time_std_dev                              (duration)>
<!ELEMENT   pd                                              (time, (shape | civicloc | (shape,
                                                            civicloc) | relativelocation),
                                                            MapData?, (alt, alt_unc?)?,
                                                             speed?, direction?, lev_conf?,
                                                            qos_not_met?, MotionStateList?,
                                                            (floor_number, floor_number_unc?)?,
                                                            uncompensatedBarometricPressure?)>
<!ELEMENT   poserr                                          (result, add_info?, time)>
<!ELEMENT   relativelocation                                ((Point | CircularArea |
                                                            EllipticalArea), ReferencePoint?)>
<!ELEMENT   floor_number                                    (#PCDATA)>
<!ELEMENT   floor_number_unc                                (#PCDATA)>
<!ELEMENT   MapData                                         (Base64Map | Url)>
<!ELEMENT   Base64Map                                       (#PCDATA)>
<!ELEMENT   Url                                             (#PCDATA)>
<!ELEMENT   MapRequest                                      (Width?, Height?, Zoom?)>
<!ATTLIST   MapRequest
            MapdataType (MAP | URL)                         "MAP"
            MimeType (GIF | JPEG |  PNG  | TIFF )           "GIF">
<!ELEMENT   Width                                           (#PCDATA)>
<!ELEMENT   Height                                          (#PCDATA)>
<!ELEMENT   Zoom                                            (#PCDATA)>
<!ATTLIST   Zoom
            ZoomType (KILOMETER | METER | MILE | INCH)      "KILOMETER">
<!ELEMENT   time                                            (#PCDATA)>
<!ATTLIST   time
            utc_off CDATA                                   "0000">
<!ELEMENT   alt                                             (#PCDATA)>
<!ELEMENT   alt_unc                                         (#PCDATA)>
<!ELEMENT   civicloc                                        (civicloc_element+)>
<!ATTLIST   civicloc
            xml:lang CDATA                                  #IMPLIED>
<!ELEMENT   civicloc_element                                (#PCDATA)>
<!ATTLIST   civicloc_element
            element_type (COUNTRY | A1 | A2 | A3 | A4 | A5  #REQUIRED
            | A6 | PRD | POD | STS | HNO | HNS | LMK | LOC
            | FLR | NAM | PC | BLD | UNIT | ROOM | PLC |
            PCN | POBOX | ADDCODE | SEAT | RD | RDSEC |
            RDBR | RDSUBBR | PRM | POM | PN | MP | STP |
            HNP | STPS | LMKP | VENUE_NAME |  VENUE_ID |
            VENUE_SPECIFIC_NAME | IANA)
            xml:lang CDATA                                  #IMPLIED
            iana_type CDATA                                 #IMPLIED>
<!ELEMENT   MotionStateList                                 (PrimaryMotionState,
                                                            SecondaryMotionState*, Confidence)>
<!ELEMENT   PrimaryMotionState                              (MotionState)>
<!ELEMENT   SecondaryMotionState                            (MotionState)>
<!ELEMENT   MotionState                                     (#PCDATA)>
<!ELEMENT   Confidence                                      (#PCDATA)>
```

```
<!ELEMENT   qos_not_met                                    EMPTY>
<!ELEMENT   direction                                      (#PCDATA)>
<!ELEMENT   speed                                          (#PCDATA)>
<!ELEMENT   lev_conf                                       (#PCDATA)>
<!ELEMENT   geo_info                                       (CoordinateReferenceSystem)>
<!ATTLIST   geo_info
            requested_positiondata ( SHAPE |CIVICLOC |     "SHAPE"
            SHAPE_AND_CIVICLOC)
            Strict (YES | NO)                              "YES">
<!ELEMENT   CoordinateReferenceSystem                      (Identifier)>
<!ELEMENT   Identifier                                     (code, codeSpace, edition)>
<!ELEMENT   code                                           (#PCDATA)>
<!ELEMENT   codeSpace                                      (#PCDATA)>
<!ELEMENT   edition                                        (#PCDATA)>
<!ELEMENT   service_coverage                               ((cc, ndc*)+)>
<!ELEMENT   MotionStateRequest                             EMPTY>
<!ELEMENT   serving_cell                                   (cgi | sai | (mcc, mnc, lte_ci) |)
<!ELEMENT   sai                                            (mcc, mnc, nr_ci))>
                                                           (mcc, mnc, lac, sac)>
<!ELEMENT   sac                                            (#PCDATA)>
<!ELEMENT   lte_ci                                         (#PCDATA)>
<!ELEMENT   nr_ci                                          (#PCDATA)>
<!ELEMENT   location_uri                                   (#PCDATA)>
<!ELEMENT   location_id                                    (#PCDATA)>
<!ELEMENT   ReferencePoint                                 (Point?, civicloc?, floor_number?)>
<!ATTLIST   ReferencePoint
            referencepoint_id CDATA                        #REQUIRED
            referencepoint_name CDATA                      #IMPLIED>
<!ELEMENT   uncompensatedBarometricPressure                (#PCDATA)>
```

For analytic reports, the parameter trl_pos does not use the msid since analytic reports apply to an entire group of users specified in the msids parameter in the tlrr request. The group of users the analytic report refers to can be derived from the req_id parameter associated with the triggered location request session. Further, the pd and time parameters of trl_pos do not apply to analytic reportsevents since (1) there are no position results to be reported and (2) the analytic_data parameter carries its own time stamp (time).

relativelocation is expressed relative to a reference point which is either implicit (e.g. provided in a service request) or explicit. When relativelocation is present, all horizontal and vertical distances are relative to the reference point.

When expressing a relative location the ReferencePoint shall if expressed as a Point use an absolute Coordinate Reference System while the shape expressing the location relative to the ReferencePoint shall use a relative Coordinate Reference System.

Examples of geo_info encoding.

The encoding for WGS84 is:

```
<CoordinateReferenceSystem>
    <Identifier>
        <code>4326</code>
        <codeSpace>EPSG</codeSpace>
        <edition>6.1</edition>
     </Identifier>
</CoordinateReferenceSystem>
```

The encoding for the Transverse Mercator coordinate system based on the OSGB1936 is:

```
<CoordinateReferenceSystem>
    <Identifier>
        <code>27700</code>
        <codeSpace>EPSG</codeSpace>
        <edition>6.1</edition>
     </Identifier>
</CoordinateReferenceSystem>
```

Note that the GML V2.1.1 Implementation Specification is limited to use of only well-known CRSs, so this XML is currently abbreviated by a single attribute name and value:

srsName=http://www.opengis.net/gml/srs/epsg.xml#4326

Note also that GML uses crsName instead of srsName.

Note that GPS or A-GPS indicates no other GNSS is used or to be used. GNSS or A-GNSS indicates at least one GANSS or A-GANSS and may include GPS or A-GPS used or to be used.

5.2.2.4 Result Element Definitions

```
<!-- MLP_RES -->
<!--
MLP V3.5 Document Type Definition

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   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ELEMENT   add_info                                          (#PCDATA)>
<!ELEMENT   result                                            (#PCDATA)>
<!ATTLIST   result
            resid CDATA                                       #REQUIRED>
```

5.2.2.5 Shape Element Definitions

```
<!-- MLP_SHAPE -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ELEMENT   shape                                             (Point | LineString | Polygon |
                                                               Box | CircularArea |
                                                               CircularArcArea |
                                                               EllipticalArea |
                                                               MultiLineString | MultiPoint |
                                                               MultiPolygon| LinearRing)>
<!ELEMENT   distanceUnit                                      (#PCDATA)>
<!ELEMENT   angularUnit                                       (#PCDATA)>
<!ELEMENT   angle                                             (#PCDATA)>
<!ELEMENT   coord                                             (X, Y?, Z?, Zone?, Hemisphere?)>
```

```
<!ELEMENT   X                                          (#PCDATA)>
<!ELEMENT   Y                                          (#PCDATA)>
<!ELEMENT   Z                                          (#PCDATA)>
<!ELEMENT   Zone                                       (#PCDATA)>
<!ELEMENT   Hemisphere                                 (#PCDATA)>
<!ELEMENT   Point                                      (coord)>
<!ATTLIST   Point
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   LineString                                 (coord, coord+)>
<!ATTLIST   LineString
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   Box                                        (coord, coord)>
<!ATTLIST   Box
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   LinearRing                                 (coord, coord, coord, coord*)>
<!ATTLIST   LinearRing
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   Polygon                                    (outerBoundaryIs,
                                                       innerBoundaryIs*)>
<!ATTLIST   Polygon
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   outerBoundaryIs                            (LinearRing)>
<!ELEMENT   innerBoundaryIs                            (LinearRing)>
<!ELEMENT   CircularArcArea                            (coord, inRadius, outRadius,
                                                        startAngle, stopAngle,
                                                        angularUnit?, distanceUnit?)>
<!ATTLIST   CircularArcArea
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   CircularArea                               (coord, radius, distanceUnit?)>
<!ATTLIST   CircularArea
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   EllipticalArea                             (coord, angle, semiMajor,
                                                        semiMinor, angularUnit?,
                                                        distanceUnit?)>
<!ATTLIST   EllipticalArea
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   inRadius                                   (#PCDATA)>
<!ELEMENT   outRadius                                  (#PCDATA)>
<!ELEMENT   radius                                     (#PCDATA)>
<!ELEMENT   semiMajor                                  (#PCDATA)>
<!ELEMENT   semiMinor                                  (#PCDATA)>
<!ELEMENT   startAngle                                 (#PCDATA)>
<!ELEMENT   stopAngle                                  (#PCDATA)>
<!ELEMENT   MultiLineString                            (LineString+)>
<!ATTLIST   MultiLineString
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   MultiPoint                                 (Point+)>
<!ATTLIST   MultiPoint
            gid ID                                     #IMPLIED
            srsName CDATA                              #IMPLIED>
<!ELEMENT   MultiPolygon                               ((Polygon| Box | CircularArea |
```

```
                                                                CircularArcArea |
                                                                EllipticalArea)+)>
<!ATTLIST   MultiPolygon
            gid ID                                              #IMPLIED
            srsName CDATA                                       #IMPLIED>

<!ELEMENT   ReferencePoint                                      (Point?, civicloc?,
                                                                floor_number?)>
```

Note also that GML uses crsName instead of srsName.

5.2.2.6 Quality of Position Element Definitions

```
<!-- MLP_QOP -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_init PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_init>
      ...
   </svc_init>

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-->

<!ELEMENT   eqop                                                (resp_req?, resp_timer?,
                                                                 (ll_acc | hor_acc)?, alt_acc?,
                                                                 max_loc_age?)>
<!ELEMENT   qop                                                 ((ll_acc | hor_acc)?,
                                                                 alt_acc?)>
<!ELEMENT   ll_acc                                              (#PCDATA)>
<!ATTLIST   ll_acc
            qos_class (ASSURED | BEST_EFFORT)                   #IMPLIED>
<!ELEMENT   hor_acc                                             (#PCDATA)>
<!ATTLIST   hor_acc
            qos_class (ASSURED | BEST_EFFORT)                   #IMPLIED>
<!ELEMENT   alt_acc                                             (#PCDATA)>
<!ATTLIST   alt_acc
            qos_class (ASSURED | BEST_EFFORT)                   #IMPLIED>
<!ELEMENT   max_loc_age                                         (#PCDATA)>
<!ELEMENT   resp_req                                            EMPTY>
<!ATTLIST   resp_req
            type (NO_DELAY | LOW_DELAY | DELAY_TOL)             "DELAY_TOL">
<!ELEMENT   resp_timer                                          (#PCDATA)>
```

5.2.2.7 GSM Network Parameters Element Definitions

```
<!-- MLP_GSM_NET -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_xxx PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_xxx>
      ...
   </svc_xxx>

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-->

<!ELEMENT   gsm_net_param                                   (cgi?, neid?, nmr?, ta?,
                                                             lmsi?, imsi?)>
<!ELEMENT   cgi                                             (mcc, mnc, lac, cellid)>
<!ELEMENT   neid                                            (vlrid |
                                                             (vmscid, vlrid?))>
<!ELEMENT   vmscid                                          (cc?, ndc?, vmscno)>
<!ELEMENT   vlrid                                           (cc?, ndc?, vlrno)>
<!ELEMENT   nmr                                             (#PCDATA)>
<!ELEMENT   mcc                                             (#PCDATA)>
<!ELEMENT   mnc                                             (#PCDATA)>
<!ELEMENT   ndc                                             (#PCDATA)>
<!ELEMENT   cc                                              (#PCDATA)>
<!ELEMENT   vmscno                                          (#PCDATA)>
<!ELEMENT   vlrno                                           (#PCDATA)>
<!ELEMENT   lac                                             (#PCDATA)>
<!ELEMENT   cellid                                          (#PCDATA)>
<!ELEMENT   ta                                              (#PCDATA)>
<!ELEMENT   lmsi                                            (#PCDATA)>
<!ELEMENT   imsi                                            (#PCDATA)>
```

Note: The above table corresponds to GSM specific network element identifiers and network parameters. This information may be considered operator sensitive.

5.2.2.8 Context Element Definitions

```
<!-- MLP_CTXT -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_xxx PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_xxx>
      ...
   </svc_xxx>

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-->
<!ELEMENT   client                                          (id, pwd?, serviceid?,
                                                            requestmode?, applicationid?)>
<!ELEMENT   sessionid                                       (#PCDATA)>
<!ELEMENT   id                                              (#PCDATA)>
<!ELEMENT   requestor                                       (id, serviceid?)>
<!ATTLIST   requestor
            type (MSISDN | IMSI | NAME | E-MAIL | URL |      "MSISDN">
            SIPURL | IMS | MDN | ASID | ASPID)
<!ELEMENT   pwd                                             (#PCDATA)>
<!ELEMENT   serviceid                                       (#PCDATA)>
<!ELEMENT   requestmode                                     EMPTY>
<!ATTLIST   requestmode
            type (ACTIVE | PASSIVE)                         "PASSIVE">


<!ELEMENT   applicationid                                   EMPTY>
<!ATTLIST   applicationid
            appProvider CDATA                               #REQUIRED
            appName CDATA                                   #REQUIRED
            appVersion CDATA                                #IMPLIED>
<!ELEMENT   subclient                                       (id, pwd?, serviceid?)>
<!ATTLIST   subclient
            last_client (YES | NO)                          "NO">
<!ELEMENT   supported_shapes                                EMPTY>
<!ATTLIST   supported_shapes
            Point  CDATA                                    "0"
            LineString CDATA                                "0"
            Polygon CDATA                                   "0"
            Box CDATA                                       "0"
            CircularArea CDATA                              "0"
            CircularArcArea CDATA                           "0"
            EllipticalArea CDATA                            "0"
            MultiLineString CDATA                           "0"
            MultiPoint CDATA                                "0"
            MultiPolygon CDATA                              "0"
            LinearRing CDATA                                "0"
            Altitude (YES|NO)                               "NO">
```

```
<!ELEMENT   serving_node_privacy_action                                  EMPTY>
<!ATTLIST   serving_node_privacy_action
            passive_type (POSITION_NOT_ALLOWED | POSITION |              #REQUIRED
            NOTIFY_AND_POSITION | POSITION_IF_NOT_DISALLOWED |
            POSITION_IF_ALLOWED)
            active_type (POSITION_NOT_ALLOWED | POSITION |               "POSITION_NOT_ALLOWED">
            NOTIFY_AND_POSITION | POSITION_IF_NOT_DISALLOWED |
            POSITION_IF_ALLOWED)
```

5.2.3 Service Layer Definitions

Each message MAY have a header part and SHALL have a body part. The body part consists of the request/answer and is described in sections 5.2.3.2-5.2.3.8. The context or header part consists of the information that identifies the client as defined in section 5.2.3.1.

5.2.3.1 Header Components

The **subclient** elements (if present) identify the ASPs, resellers and portals in the chain of service providers between the network and the end-user. The distinction between **client** and **subclient** elements is that the **client** element identifies the provider of the service that the Location Server has the main relationship with, whereas the **subclient** elements identify the chain of other service providers up to the end-user. The final service provider in the chain is identified as such (last_client="YES"). The **requestor** indicates the initiator of the location request, so in this context besides an ASP it could also be an MS subscriber who is asking the position of another target MS. The identity of the **requestor** may be an MSISDN or any other identifier identifying the initiator of the location request.

The **serviceid** element can be present in **client, subclient** and **requestor** elements. If the Location Server supports **serviceid** element for privacy checking procedure it SHALL use the **serviceid** element received in the **client** element. The Location Server MAY check that all **serviceid** element received in a location request are consistent and MAY reject a request if not.

The **sessionid** element is used to represent the current session between the LCS Client and the Location Server. It MAY be used to replace the **id** and **pwd** elements, used in the context by the LCS Client to "login" to the Location Server, for the transactions that make up a session. For the first transaction of the session the LCS Client SHALL "login" as usual. The Location Server MAY optionally return the **sessionid** in the response to this first transaction. If the Location Server does not return a **sessionid** the LCS Client SHALL continue to "login" for subsequent transactions. The LCS Client MAY ignore the **sessionid** if desired and continue to "login" for subsequent transactions.

A LCS Client MAY include the **serving_node_privacy_action** element to indicate to Location Server that a specified privacy action related to the serving node collected by the LCS Client SHOULD be performed by the Location Server in addition to any actions based on privacy policies in the Location Server. If privacy actions requested by LCS Client are in conflict with policies in the Location Server the policies in the Location Server SHALL have precedence.

The Location Server will decide the policy to be used to determine how the **sessionid** will be created and maintained. For example, the Location Server may determine the session as being just the transactions pertaining to a single service/MSID combination – this being restrictive and hence secure whilst still being useable, or the Location Server may allow the session to apply to a number of transactions between the Location Server and LCS Client. The Location Server may also allow the **sessionid** to be used for a particular period of time. The Location Server may also decide to return a different **sessionid** on each response, which the LCS Client will then use on the next transaction of the session.

The **sessionid** cannot be used instead of the **req_id** as this latter id refers to a set of reports that have been requested to be delivered from the Location Server to the LCS Client and do not form part of an existing LCS Client to Location Server connection. These reports are delivered by the Location Server "logging in" to the LCS Client for each delivery and the use of a **sessionid**, would allow the security of the LCS Client to be breached.

5.2.3.1.1 Header DTD

```
<!-- MLP_HDR -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_xxx PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_xxx>
      ...
   </svc_xxx>

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http://www.openmobilealliance.org/
-->

<!ELEMENT   hdr                        ((sessionid | (client , sessionid?)), subclient*,
                                        requestor?, supported_shapes?, serving_node_privacy_action?)>
<!ATTLIST   hdr
            ver CDATA                  #FIXED "3.5.0">
```

Example 1: ASP as Initiator

```
<hdr ver="3.5.0">
  <client>
    <id>theasp</id>
    <pwd>thepwd</pwd>
    <serviceid>0005</serviceid>
    <requestmode type="PASSIVE"/>
    <applicationid appProvider="TheAppProvider" appName="Fleet Tracker" appVersion="3.1.2" />
  </client>
  <subclient last_client="YES">
    <id>thelastasp</id>
    <serviceid>0005</serviceid>
  </subclient>
  <requestor>
    <id>theoriginalasp</id>
    <serviceid>0005</serviceid>
  </requestor>
</hdr>
```

Example 2: MS as Initiator

```
<hdr ver="3.5.0">
  <client>
    <id>theasp</id>
    <pwd>thepwd</pwd>
    <serviceid>0005</serviceid>
    <requestmode type="ACTIVE"/>
  </client>
  <requestor>
    <id>461018765710</id>
  </requestor>
</hdr>
```

5.2.3.2 Standard Location Immediate Service

This is a standard service for requesting the location of one or more Mobile Subscribers. The service is used when a single location response is required immediately (within a set time) or when . several asynchronous location responses can be returned (until a predefined timeout limit is reached).

When a lot of positioning reports are requested, it may take an unacceptably long time to get all the responses from the network. If the Location Server supports it the LCS Client can define how to receive the location responses, either at the time of the response to the request, or individually using one or more connections initiated by the Location Server.

The extended service supports a number of different formats for describing the location of the mobile subscriber. It has also support for requesting a certain Quality of Service, Type of location and priority.

The service consists of the following messages:

- Standard Location Immediate Request
- Standard Location Immediate Answer
- Standard Location Immediate Report

The Standard Location Immediate Service SHALL consist of a Standard Location Immediate Request followed by one Standard Location Immediate Answer and zero, one or more OPTIONAL Standard Location Immediate Reports. Standard Location Immediate Reports can only be returned by Location Server if the attribute "res_type" is set to "ASYNC" by the LCS Client.

The following message flow as depicted in Figure 3 encapsulates this service:

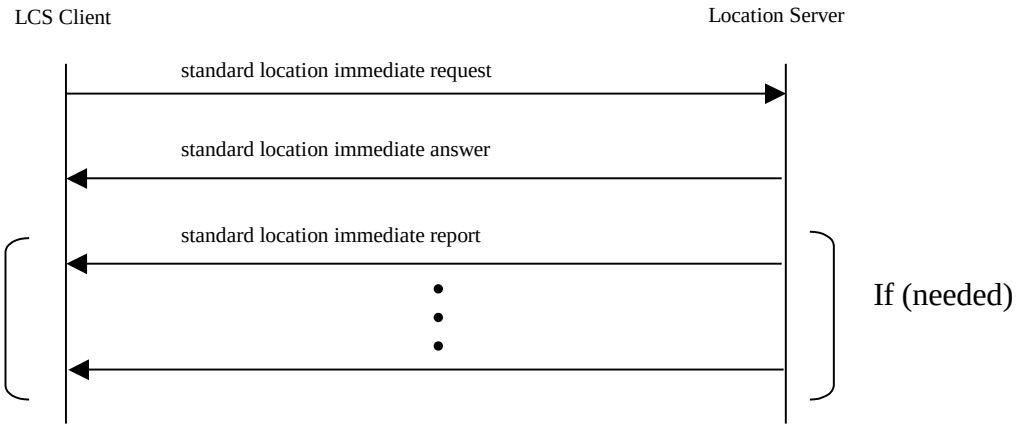

Figure 3: Message Flow for the Standard Location Immediate Service

Note: Multiple Standard Location Immediate Reports can occur when the location information for multiple targets was requested or the request allowed for an intermediate position and the results are reported back to the client in individual reports. An individual report may contain the result of one or more targets. It may also contain an intermediate position, not matching the requested QoP, but of increasing accuracy for each target.

5.2.3.2.1 Standard Location Immediate Request DTD

```
<!-- MLP_SLIR -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_init PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_init>
      ...
   </svc_init>

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http://www.openmobilealliance.org/
-->

<!ENTITY    % extension.param          "">

<!ELEMENT   slir                      ((msids | (msid, codeword?, gsm_net_param, trans_id?)+),
                                      eqop?, geo_info?, loc_type?, prio?, pushaddr?,
                                      service_coverage?, MapRequest?, MotionStateRequest?,
                                      ReferencePoint? %extension.param;)>
<!ATTLIST   slir
            ver CDATA                 #FIXED "3.5.0"
            res_type (SYNC | ASYNC)   "SYNC">
```

If the ReferencePoint element is provided in slir, the location response SHOULD be expressed as relative location (i.e., as location relative to the ReferencePoint). If the location server is unable to return a relative location, an absolute location MAY be returned instead.

Example

```
<slir ver="3.5.0" res_type="SYNC">
  <msids>
    <msid type="IPV4">93.10.0.250</msid>
    <msid_range>
      <start_msid>
        <msid>461018765710</msid>
      </start_msid>
      <stop_msid>
        <msid>461018765712</msid>
      </stop_msid>
    </msid_range>
    <msid type="ASID">441728922342</msid>
    <msid_range>
      <start_msid>
        <msid>461018765720</msid>
      </start_msid>
      <stop_msid>
        <msid>461018765728</msid>
      </stop_msid>
    </msid_range>
  </msids>
  <eqop>
    <resp_req type="LOW_DELAY" />
    <hor_acc>1000</hor_acc>
  </eqop>
  <geo_info>
    <CoordinateReferenceSystem>
```

```
          <Identifier>
            <code>4004</code>
            <codeSpace>EPSG</codeSpace>
            <edition>6.1</edition>
          </Identifier>
        </CoordinateReferenceSystem>
      </geo_info>
      <loc_type type="CURRENT_OR_LAST" />
      <prio type="HIGH" />
    </slir>
```

5.2.3.2.2 Standard Location Immediate Answer DTD

```
<!-- MLP_SLIA -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   slia                     ((pos+ | req_id | (result, add_info?)) %extension.param;)>
<!ATTLIST   slia
            ver CDATA                #FIXED "3.5.0">
```

Example 1: Successful positioning of multiple subscribers

```
    <slia ver="3.5.0" >
      <pos>
        <msid>461011334411</msid>
        <pd>
          <time utc_off="+0200">20020623134453</time>
          <shape>
            <CircularArea srsName="www.epsg.org#4326">
                 <coord>
                  <X>30 16 28.308N</X>
                  <Y>45 15 33.444E</Y>
                 </coord>
                 <radius>240</radius>
            </CircularArea>
          </shape>
        </pd>
      </pos>
      <pos>
        <msid>461018765710</msid>
        <pd>
          <time utc_off="+0300">20020623134454</time>
          <shape>
            <CircularArea srsName="www.epsg.org#4326">
              <coord>
                <X>30 12 28.296N</X>
                <Y>86 56 33.864E</Y>
              </coord>
```

```
            <radius>570</radius>
          </CircularArea>
        </shape>
      </pd>
    </pos>
    <pos>
      <msid>461018765711</msid>
      <pd>
        <time utc_off="+0300">20020623110205</time>
        <shape>
            <CircularArea srsName="www.epsg.org#4326">
              <coord>
                <X>78 12 34.308N</X>
                <Y>76 22 2.82E</Y>
              </coord>
              <radius>15</radius>
            </CircularArea>
        </shape>
      </pd>
    </pos>
    <pos>
      <msid>461018765712</msid>
      <poserr>
        <result resid="10">QOP NOT ATTAINABLE</result>
        <time>20020623134454</time>
      </poserr>
    </pos>
  </slia>
```

Example 2: Service not supported

```
  <slia ver="3.5.0" >
    <result resid="108">SERVICE NOT SUPPORTED</result>
    <add_info>'slir' is not supported by the location server</add_info>
  </slia>
```

5.2.3.2.3 Standard Location Immediate Report DTD

```
<!-- MLP_SLIREP -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   slirep                   (req_id, pos+ %extension.param;)>
<!ATTLIST   slirep
            ver CDATA                #FIXED "3.5.0">
```

Example

```
  <slirep ver="3.5.0">
    <req_id>25267</req_id>
```

```
    <pos>
      <msid type="IPV6">10:A1:45::23:B7:89</msid>
      <pd>
        <time utc_off="+0300">20020813010423</time>
        <shape>
          <CircularArea srsName="www.epsg.org#4326">
            <coord>
              <X>35 03 28.244N</X>
              <Y>135 47 08.711E</Y>
            </coord>
            <radius>15</radius>
          </CircularArea>
        </shape>
      </pd>
    </pos>
  </slirep>
```

5.2.3.3 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.

When there is a chance that one location fix may block a location fix which takes a shorter time (eg A-GPS fix and a Cell-ID based fix) then if the Location Server supports it the LCS Client can define how to receive the location responses individually using one or more connections initiated by the Location Server.

The service consists of the following messages:

- Emergency Location Immediate Request
- Emergency Location Immediate Answer
- Emergency Location Immediate Report

The Emergency Location Immediate Service SHALL consist of a Emergency Location Immediate Request followed by one Emergency Location Immediate Answer and zero, one or more OPTIONAL Emergency Location Immediate Reports. When the location of a single mobile subscriber is requested the Emergency Location Immediate Request MAY include alternative identities of the mobile subscriber.

The following message flow as depicted in Figure 4 encapsulates this service:

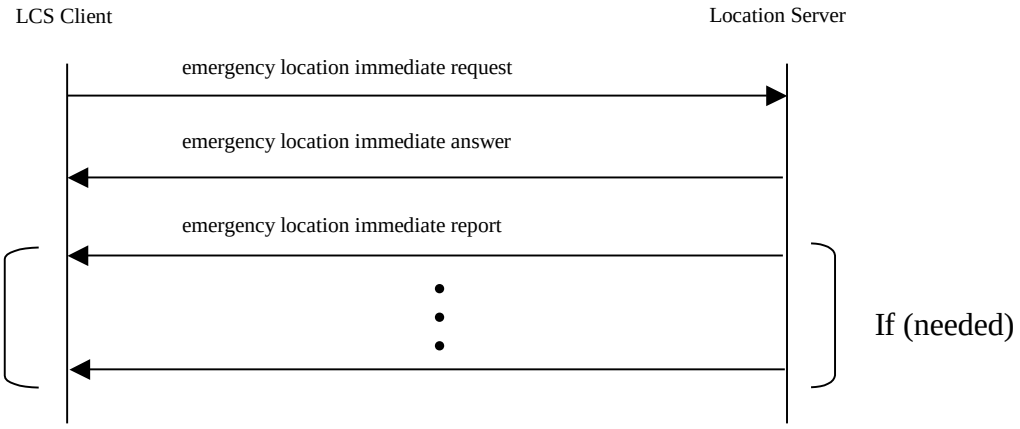

Figure 4: Message Flow for the Emergency Location Immediate Service

Note: Multiple Emergency Location Immediate Reports can occur when the location information for multiple targets was requested or the request allowed for an intermediate position and the results are reported back to the client in individual reports. An individual report may contain the result of one or more targets. It may also contain an intermediate position, not matching the requested QoP, but of increasing accuracy for each target.

5.2.3.3.1 Emergency Location Immediate Request DTD

```
<!-- MLP_EME_LIR -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_init PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_init>
      ...
   </svc_init>

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http://www.openmobilealliance.org/
-->

<!ENTITY    % extension.param         "">

<!ELEMENT   eme_lir                  ((msids | (msid+, gsm_net_param?, trans_id?, esrd?, esrk? ,
                                     supl_support_params?, target_serving_node?)+), eqop?,
                                     geo_info?, loc_type? , pushaddr?, MapRequest?,
                                     ReferencePoint?  %extension.param;)>
<!ATTLIST   eme_lir
            ver CDATA                #FIXED "3.5.0"
            res_type (SYNC | ASYNC)  "SYNC">
```

If the ReferencePoint element is provided in eme_lir, the location response SHOULD be expressed as relative location (i.e., as location relative to the ReferencePoint). If the location server is unable to return a relative location, an absolute location MAY be returned instead.

Example 1

```
<eme_lir ver="3.5.0">
  <msids>
    <msid type="EME_MSID">520002-51-431172-6-06</msid>
  </msids>
  <geo_info>
    <CoordinateReferenceSystem>
      <Identifier>
        <code>4325</code>
        <codeSpace>EPSG</codeSpace>
        <edition>6.1</edition>
       </Identifier>
    </CoordinateReferenceSystem>
  </geo_info>
  <loc_type type="CURRENT_OR_LAST" />
</eme_lir>
```

Example 2

```
<eme_lir ver="3.5.0" res_type="ASYNC">
  <msids>
    <msid type="EME_MSID">520002-51-431172-6-06</msid>
   </msids>

  <geo_info>
    <CoordinateReferenceSystem>
      <Identifier>
        <code>4326</code>
        <codeSpace>EPSG</codeSpace>
```

```
            <edition>6.1</edition>
           </Identifier>
         </CoordinateReferenceSystem>
        </geo_info>
        <loc_type type="CURRENT_OR_LAST" />
        <pushaddr>
          <url>http://location.application.com</url>
        </pushaddr>
        </eme_lir>
```

Example 3 (with two alternative identities of target and identity of serving node)

```
      <eme_lir ver="3.5.0">
        <msid type="MSISDN">461018765710</msid>
        <msid type="IMEI">35850604062684</msid>
        <target_serving_node>
          <vmscid>
            <vmscno>1541154871</vmscno>
          </vmscid>
        </target_serving_node>
        <geo_info>
          <CoordinateReferenceSystem>
            <Identifier>
              <code>4325</code>
              <codeSpace>EPSG</codeSpace>
              <edition>6.1</edition>
             </Identifier>
          </CoordinateReferenceSystem>
        </geo_info>
        <loc_type type="CURRENT_OR_LAST" />
        </eme_lir>
```

5.2.3.3.2 Emergency Location Immediate Answer DTD

```
<!-- MLP_EME_LIA -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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http://www.openmobilealliance.org/
-->

<!ENTITY    % extension.param          "">

<!ELEMENT   eme_lia                   ((eme_pos+ | req_id | (result, add_info?))
                                      %extension.param;)>
<!ATTLIST   eme_lia
            ver CDATA                 #FIXED "3.5.0">
```

Example

```
      <eme_lia ver="3.5.0">
        <eme_pos>
          <msid type="EME_MSID">520002-51-431172-6-06</msid>
          <pd>
            <time utc_off="+0300">20020623134453</time>
```

```
          <shape>
            <CircularArea srsName="www.epsg.org#4326">
              <coord>
                <X>30 24 43.53N</X>
                <Y>45 28 09.534W</Y>
              </coord>
              <radius>15</radius>
            </CircularArea>
          </shape>
        </pd>
        <esrk>7839298236</esrk>
      </eme_pos>
    </eme_lia>
```

5.2.3.3.3 Emergency Location Immediate Report DTD

```
<!-- MLP_EME_LIREP -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   eme_lirep                (req_id, (eme_pos+ | (result, add_info?))
                                     %extension.param;)>
<!ATTLIST   eme_lirep
            ver CDATA                #FIXED "3.5.0">
```

Example

```
    <eme_lirep ver="3.5.0">
      <req_id>25687</req_id>
      <eme_pos>
        <msid type="EME_MSID">520002-51-431172-6-06</msid>
        <pd>
          <time utc_off="+0300">20020623134453</time>
          <shape>
            <CircularArea srsName="www.epsg.org#4326">
              <coord>
                <X>30 24 43.53N</X>
                <Y>45 28 09.534W</Y>
              </coord>
              <radius>15</radius>
            </CircularArea>
          </shape>
        </pd>
        <esrk>7839298236</esrk>
      </eme_pos>
    </eme_lirep>
```

5.2.3.4 Standard Location Reporting Service

When a mobile subscriber wants an LCS client to receive the MS location, e.g. by initiating a MO-LR procedure according to [23.271], a standard location report is generated. The LCS Client that the location report should be sent to SHALL be specified by the MS or defined within the Location Server.

The service consists of the following message:

- Standard Location Report
- Standard Location Report Answer

The Standard Location Reporting Service SHALL consist of one Standard Location Report followed by one Standard Location Report Answer.

The following message flow as depicted in Figure 5 encapsulates this service:

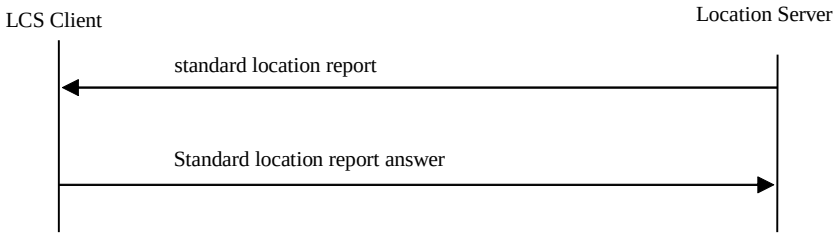

Figure 5: Message flow for the Standard Location Reporting Service

5.2.3.4.1 Standard Location Report DTD

```
<!-- MLP_SLREP -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   slrep                    (pos+ %extension.param;)>
<!ATTLIST   slrep
            ver CDATA                #FIXED "3.5.0">
```

Example

```
<slrep ver="3.5.0">
```

```
    <pos>
      <msid>461011678298</msid>
      <pd>
        <time>20020813010423</time>
        <shape>
          <CircularArea srsName="www.epsg.org#4326">
            <coord>
              <X>30 45 35.41N</X>
              <Y>45 32 55.02E</Y>
            </coord>
            <radius>15</radius>
          </CircularArea>
        </shape>
      </pd>
    </pos>
  </slrep>
```

5.2.3.4.2 Standard Location Report Answer DTD

```
<!-- MLP_SLRA -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   slra                     ((result, add_info?) %extension.param;)>
<!ATTLIST   slra
            ver CDATA                #FIXED "3.5.0">
```

Example 1: SLRA in case the handling of corresponding SLREP was successful

```
  <slra ver="3.5.0">
    <result resid="0">OK</result>
  </slra>
```

Example 2: SLRA in case the handling of corresponding SLREP was in error

```
  <slra ver="3.5.0">
    <result resid="4">UNKNOWN SUBSCRIBER</result>
    <add_info> the subscriber is not registered in the LCS Client</add_info>
  </slra>
```

5.2.3.5 Emergency Location Reporting Service

If the wireless network initiates a positioning because a user initiates or releases an emergency call, or handover occurs during an emergency call, an emergency location report is generated. The application(s) that the emergency location report should be sent to SHALL be defined within the location server. Data as required geographical format and address to application SHALL also be defined within the location server.

The service consists of the following message:

- Emergency Location Report

The Emergency Location Reporting Service SHALL consist of one Emergency Location Report. If the Emergency Location Report is sent due to a handover it SHALL include the identity of the target serving node.

The Emergency Location Report MAY include a location estimate and/or the serving cell identity. When to populate these information elements is outside the scope of this document.

The Emergency Location Report MAY include alternative identities of the mobile subscriber.

The Emergency Location Report MAY include the address of the Location Server. The address is typically used by the LCS Client when requesting Emergency Location Immediate Service from the Location Server.

The following message flow as depicted in Figure 6 encapsulates this service:

Figure 6: Message Flow for the Emergency Location Reporting Service

5.2.3.5.1 Emergency Location Report DTD

```
<!-- MLP_EMEREP -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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http://www.openmobilealliance.org/
-->

<!ENTITY    % extension.param         "">

<!ELEMENT   emerep                   (eme_event, locationserver_address? %extension.param;)>
<!ATTLIST   emerep
            ver CDATA                #FIXED "3.5.0">
```

Example 1

```
<emerep ver="3.5.0">
  <eme_event eme_trigger="EME_ORG">
    <eme_pos>
      <msid>461011678298</msid>
      <pd>
        <time utc_off="+0300">20020623010003</time>
        <shape>
```

```
            <CircularArea srsName="www.epsg.org#4326">
              <coord>
                <X>30 27 45.3N</X>
                <Y>45 25 50.78E</Y>
              </coord>
              <radius>15</radius>
            </CircularArea>
          </shape>
        </pd>
      </eme_pos>
    </eme_event>
  </emerep>
```

Example 2

```
<emerep ver="3.5.0">
  <eme_event eme_trigger="EME_HO">
    <eme_pos>
      <msid>461011678298</msid>
      <msid type="IMEI">35850604062684</msid>
      <servingcell>
        <cgi>
         <mcc>234</mcc>
         <mnc>215</mnc>
         <lac>234</lac>
         <cellid>546</cellid>
        </cgi>
      </servingcell>
      <target_serving_node>
        <vmscid>
          <vmscno>1541154871</vmscno>
        </vmscid>
      </target_serving_node>
    </eme_pos>
  </eme_event>
</emerep>
```

5.2.3.6 Triggered Location Reporting Service

The triggered location reporting service is used when an application wants the position of several MSs to be tracked or when analytic data for a target area or ALN is required. The triggers could be:

- The periodicity of reporting defined by an interval time
- An MS action, defined as the event "UE available" in 3GPP [23.271].
- A Change of Area, defined as the event “change of area” in 3GPP [23.271].
- An Velocity Event , defined as the event “Velocity Event” in [SUPL 3.0].
- A Distance Event, that is based on the the distances between the target MS and one or more reference objects.
- An Equidistance Event, that is based on the distance travelled from the last report.
- An ALN event, that is based on an MS entering, leaving or being within an ALN.

A report will be triggered when one of the pre-defined MS’s actions occurred or the time interval elapses. In the case of analytic reports, a report is sent after each interval. If reporting is based on an interval the reporting can be also be defined to utilize quasirealtime and batch reporting modes. In quasirealtime mode, reports are not sent if the target has become unavailable but are instead sent at later time when location information has become available. In batch reporting modes the request includes a condition when reports shall be sent. The condition can be a number of measurement, a time expressed in minutes or when the service terminates.

The service consists of the following messages:

- Triggered Location Reporting Request
- Triggered Location Reporting Answer
- Triggered Location Report
- Triggered Location Reporting Stop Request
- Triggered Location Reporting Stop Answer
- Triggered Location Reporting Pause Report

- Triggered Location Reporting Query Request
- Triggered Location Reporting Query Answer
- Triggered Location Query Report

The Triggered Location Reporting Service SHALL consist of a Triggered Location Reporting Request followed by one Triggered Location Reporting Answer and zero, one or more OPTIONAL Triggered Location Reports. When it is assumed that only one location report is to be sent but it is unfeasible to include all information in one Triggered Location Report the information MAY be segmented into multiple Triggered Location Reports. The segmentation is indicated by a “more” attribute.

The Triggered Location Reporting Service MAY also include Triggered Location Reporting Stop Request that SHALL be followed by one Triggered Location Reporting Stop Answer. This Triggered Location Reporting Stop Request MAY allow stopping triggered location reporting for any individual target(s) included in the Triggered Location Reporting Request. Additionally a Triggered Location Reporting Stop Answer MAY be sent without preceeding Triggered Location Reporting Stop Request.

The Triggered Location Reporting Service MAY also include one or more Triggered Location Reporting Pause Report. This message informs the LCS Client that the reporting has been paused or resumed.

The Triggered Location Reporting Service MAY also include a Triggered Location Reporting Query Request that SHALL be followed by one Triggered Location Reporting Query Answer and one or more Triggered Location Query Reports. This Triggered Location Reporting Query Request MAY allow the LCS Client to query the Location Server for reporting of all still active trigger reguests related to the LCS Client.

The following message flow as depicted in Figure 7 encapsulates this service:

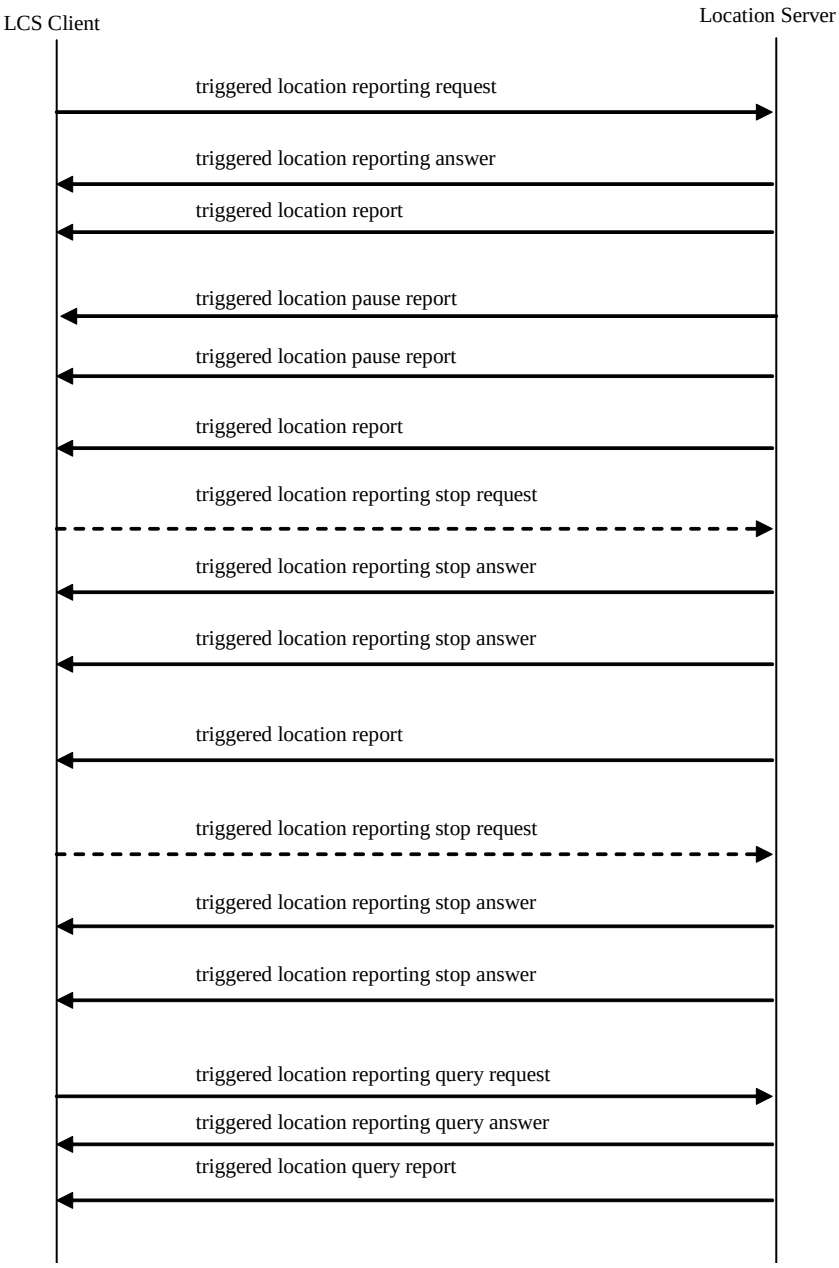

Figure 7: Message Flow for the Triggered Location Reporting Service

Note:If the network unilaterally decides to terminate the location reporting, the stop reporting information SHALL be carried in a tlrep.The cancellation of triggered location reporting request could be initiated by the Location Server itself for some reasons such as privacy profile update. In this case a tlrsa MAY be sent without a preceding tlrsr.

5.2.3.6.1 Triggered Location Reporting Request DTD

```
<!-- MLP_TLRR -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_init PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_init>
      ...
   </svc_init>

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http://www.openmobilealliance.org/
-->

<!ENTITY    % extension.param          "">

<!ELEMENT   tlrr                      (msids, interval?, start_time?, stop_time?, duration?,
                                       tlrr_event?, analytic_report?, qop?, geo_info?, pushaddr?,
                                       loc_type?, prio?, service_coverage?, MapRequest?,
                                       ReferencePoint?  %extension.param;)>
<!ATTLIST   tlrr
            ver CDATA                 #FIXED "3.5.0">
```

The following rules apply to the use of ‘start_time’, ‘stop_time’, ‘interval’ , ’duration’, ‘tlrr_event’, ‘analytic_report’ and ‘loc_type’:

- TLRR with ‘interval’ SHALL be interpreted as a request for periodic location reports or analytic reports, and TLRR with ‘tlrr_event’ SHALL be interpreted as a request for a location report on the occurrence of a specific event. ‘interval’ and ‘tlrr_event’ MAY be combined for combined periodic and event based location request. When neither ‘interval’ nor ‘tlrr_event’ is specified in TLRR, the Location Server MUST reject the request with an error indication ‘106’ to the client.
- TLRR with ‘analytic_report’ is only valid when ‘interval’ is present and ‘tlrr_event’ is absent and SHALL be interpreted as a request for statistical information on devices identified by ‘msids’ that are within an area identified by ‘analytic_report’. Locations of devices SHALL not then be reported. If ‘msids’ identifies an anonymous device, statistical information on all devices SHALL be reported.
- If no START_TIME is specified reporting SHALL start immediately.
- If no STOP_TIME is specified the reporting SHOULD occur until explicitly canceled with ‘Triggered Location Stop Request’ or a time out occurs (depending on system configuration). Timeout MAY be reported to the LCS client by 'time_remaining' in triggered location report.
- If STOP_TIME and Duration are both presented in one request, the Location Server MUST reject the request with an error indication ‘110’ to the client.
- If START_TIME is ‘older’ than the current time then the Location Server MUST reject the request with an error indication ‘110’ to the client.
- If STOP_TIME is ‘older’ than then current time then the Location Server MUST reject the request with an error indication ‘110’ to the client.
- If STOP_TIME is earlier than START_TIME then the implementation MUST reject the request with an error indication ‘110’ to the client.
- If STOP_TIME is equal to START_TIME then the Location Server MUST return a single location report or analytic report to the client at the specified time. Any interval specified MUST be ignored.

- If Duration is specified as zero the Location Server MUST return a single location report or analytic report to the client at the specified time. Any interval specified MUST be ignored.
- If Loc_type is specified as LAST the Location Server MUST evaluate the trigger criteria based on stored location information.
- If the ReferencePoint element is provided in tlrr, the location response SHOULD be expressed as relative location (i.e., as location relative to the ReferencePoint). If the location server is unable to return a relative location, an absolute location MAY be returned instead.

The (optional) parameter 'service_coverage' is only allowed for plain periodic requests, i.e. not for event-related requests like MS_Available triggers or area triggers.

Example 1: TLRR for periodic location reports during a period specified by ‘start_time’ and ‘stop_time’

```
<tlrr ver="3.5.0">
  <msids>
    <msid>461011678298</msid>
  </msids>
  <interval>00003000</interval>
  <start_time utc_off="+0300">20021003112700</start_time>
  <stop_time utc_off="+0300">20021003152700</stop_time>
  <qop>
    <hor_acc>100</hor_acc>
  </qop>
  <geo_info>
    <CoordinateReferenceSystem>
      <Identifier>
        <code>4326</code>
        <codeSpace>EPSG</codeSpace>
        <edition>6.1</edition>
      </Identifier>
    </CoordinateReferenceSystem>
  </geo_info>
  <pushaddr>
    <url>http://location.application.com</url>
  </pushaddr>
  <loc_type type="CURRENT" />
  <prio type="HIGH" />
</tlrr>
```

Example 2: TLRR for single location report at a specified time. ‘stop_time’ is specified equal to ‘start_time’.

```
<tlrr ver="3.5.0">
  <msids>
    <msid>461011678298</msid>
  </msids>
  <interval>00003000</interval>
  <start_time utc_off="+0300">20021003112700</start_time>
  <stop_time utc_off="+0300">20021003112700</stop_time>
  <qop>
    <hor_acc>100</hor_acc>
  </qop>
  <geo_info>
    <CoordinateReferenceSystem>
      <Identifier>
        <code>4004</code>
        <codeSpace>EPSG</codeSpace>
        <edition>6.1</edition>
      </Identifier>
    </CoordinateReferenceSystem>
  </geo_info>
  <pushaddr>
    <url>http://location.application.com</url>
  </pushaddr>
  <loc_type type="CURRENT" />
  <prio type="HIGH" />
</tlrr>
```

Example 3: TLRR for a location report on the occurrence of a MS_AVAIL event after a specified time.

```
<tlrr ver="3.5.0">
  <msids>
```

```
    <msid>461011678298</msid>
  </msids>
  <start_time utc_off="+0300">20021003112700</start_time>
  <tlrr_event>
<ms_action type="MS_AVAIL"/>
</tlrr_event>
  <qop>
    <hor_acc>100</hor_acc>
  </qop>
  <geo_info>
    <CoordinateReferenceSystem>
      <Identifier>
        <code>4326</code>
        <codeSpace>EPSG</codeSpace>
        <edition>6.1</edition>
      </Identifier>
    </CoordinateReferenceSystem>
  </geo_info>
  <pushaddr>
    <url>http://location.application.com</url>
  </pushaddr>
  <loc_type type="CURRENT" />
  <prio type="HIGH" />
</tlrr>
```

Example 4: TLRR for periodic location reports from current time and lasting for a specified period

```
<tlrr ver="3.5.0">
  <msids>
    <msid>461011678298</msid>
  </msids>
  <interval>00003000</interval>
  <duration>00009000</duration>
  <qop>
    <hor_acc>100</hor_acc>
  </qop>
  <geo_info>
    <CoordinateReferenceSystem>
      <Identifier>
        <code>4326</code>
        <codeSpace>EPSG</codeSpace>
        <edition>6.1</edition>
      </Identifier>
    </CoordinateReferenceSystem>
  </geo_info>
  <pushaddr>
    <url>http://location.application.com</url>
  </pushaddr>
  <loc_type type="CURRENT" />
  <prio type="HIGH" />
</tlrr>
```

Example 5: TLRR for a change_area report on the occurrence of a MS_ENTERING event

```
<tlrr ver="3.5.0">
  <msids>
    <msid>461011678298</msid>
  </msids>
  <tlrr_event>
    <change_area type="MS_ENTERING" loc_estimates="TRUE">
      <target_area>
        <name_area>Seoul</name_area>
      </target_area>
    </change_area>
  </tlrr_event>
  <qop>
    <hor_acc>100</hor_acc>
  </qop>
  <geo_info>
    <CoordinateReferenceSystem>
      <Identifier>
        <code>4326</code>
        <codeSpace>EPSG</codeSpace>
        <edition>6.1</edition>
```

```
      </Identifier>
    </CoordinateReferenceSystem>
  </geo_info>
  <pushaddr>
    <url>http://location.application.com</url>
  </pushaddr>
  <loc_type type="CURRENT" />
  <prio type="HIGH" />
</tlrr>
```

Example 6: TLRR for a change_area report on the occurrence of a MS_WITHIN_AREA within a geographical area.

```
<tlrr ver="3.5.0">
  <msids>
    <msid>461011678298</msid>
  </msids>
  <tlrr_event>
    <change_area type="MS_WITHIN_AREA" loc_estimates="FALSE">
      <target_area>
        <shape>
          <CircularArea srsName="www.epsg.org#4326">
            <coord>
              <X>35 35 24.139N</X>
              <Y>139 35 24.754E</Y>
            </coord>
            <radius>15</radius>
          </CircularArea>
        </shape>
      </target_area>
      <no_of_reports>10</no_of_reports>
      <minimumIntervalTime>30</minimumIntervalTime>
    </change_area>
  </tlrr_event>
  <pushaddr>
      <url>http://location.application.com</url>
  </pushaddr>
</tlrr>
```

Example 7: TLRR for combined periodic / MS_AVAIL event

```
<tlrr ver="3.5.0">
  <msids>
    <msid>461011678298</msid>
  </msids>
  <interval>00003000</interval>
  <duration>00009000</duration>
  <tlrr_event>
    <ms_action type="MS_AVAIL"/>
  </tlrr_event>
  <qop>
    <hor_acc>100</hor_acc>
  </qop>
  <geo_info>
    <CoordinateReferenceSystem>
      <Identifier>
        <code>4326</code>
        <codeSpace>EPSG</codeSpace>
        <edition>6.1</edition>
      </Identifier>
    </CoordinateReferenceSystem>
  </geo_info>
  <pushaddr>
    <url>http://location.application.com</url>
  </pushaddr>
  <loc_type type="CURRENT" />
  <prio type="HIGH" />

 </tlrr>
```

5.2.3.6.2 Triggered Location Reporting Answer DTD

```
<!-- MLP_TLRA -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param          "">

<!ELEMENT   tlra                      (((req_id, lcs_ref?) | (result, add_info?))
                                      %extension.param;)>
<!ATTLIST   tlra
            ver CDATA                 #FIXED "3.5.0">
```

The (optional) parameter 'lcs_ref' shall be sent to the LCS Client in case the Requesting Location Server receives it from Home Location Server.

Example 1: TLRA if corresponding TLRR was successful

```
<tlra ver="3.5.0">
  <req_id>25293</req_id>
  <lcs_ref>50</lcs_ref>
</tlra>
```

Example 2: TLRA if corresponding TLRR was in error

```
<tlra ver="3.5.0">
  <result resid="4">UNKNOWN SUBSCRIBER</result>
</tlra>
```

5.2.3.6.3 Triggered Location Report DTD

```
<!-- MLP_TLREP -->
<!--
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   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param          "">

<!ELEMENT   tlrep                     (req_id, lcs_ref?, trl_pos+, time_remaining?
                                      %extension.param;)>
<!ATTLIST   tlrep
            ver CDATA                 #FIXED "3.5.0"
            More (YES | NO)           "NO">
```

The (optional) parameter 'lcs_ref' shall be sent to the LCS Client in case the Requesting Location Server receives it from Home Location Server.

The attribute 'more' set to YES indicates that the location report is segmented into several tlrep and more tlrep will follow. The last tlrep within a location report will have attriute 'more' set to NO (explicit or by default).

Example 1: Successful positioning of periodic location report

```
<tlrep ver="3.5.0">
  <req_id>25267</req_id>
  <lcs_ref>50</lcs_ref>
  <trl_pos trl_trigger="PERIODIC">
    <msid>461011678298</msid>
    <pd>
      <time utc_off="+0300">20020813010423</time>
      <shape>
        <CircularArea srsName="www.epsg.org#4326">
          <coord>
            <X>35 35 24.139N</X>
            <Y>139 35 24.754E</Y>
          </coord>
          <radius>15</radius>
        </CircularArea>
      </shape>
    </pd>
  </trl_pos>
  <time_remaining>00010000</time_remaining>
</tlrep>
```

Example 2: Cancellation of triggered location report

```
<tlrep ver="3.5.0">
  <req_id>25267</req_id>
  <lcs_ref>50</lcs_ref>
  <trl_pos trl_trigger="PERIODIC">
```

```
        <msid>461011678298</msid>
        <poserr>
     <result resid="114"> CANCELLATION OF TRIGGERED LOCATION REQUEST</result>
     <time utc_off="+0200">20041007110237</time>
        </poserr>
      </trl_pos>
     </tlrep>
```

5.2.3.6.4 Triggered Location Reporting Stop Request DTD

```
<!-- MLP_TLRSR -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_init PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_init>
      ...
   </svc_init>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   tlrsr                    ((msids | msid)?, req_id, lcs_ref? %extension.param;)>
<!ATTLIST   tlrsr
            ver CDATA                #FIXED "3.5.0">
```

The parameter ‘msids’/‘msid’ here means the individual targets whose triggered location reporting will be stopped. If neither msids nor msid is present, the stop request applies to all individual targets.

Example

```
     <tlrsr ver="3.5.0">
       <req_id>25293</req_id>
       <lcs_ref>50</lcs_ref>
     </tlrsr>
```

5.2.3.6.5 Triggered Location Reporting Stop Answer DTD

```
<!-- MLP_TLRSA -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param          "">

<!ELEMENT   tlrsa                     ((((msids | msid)?, req_id) | (result, add_info?))
                                      %extension.param;)>
<!ATTLIST   tlrsa
            ver CDATA                 #FIXED "3.5.0">
```

The parameter ‘msids’/‘msid’ here means the individual targets whose triggered location reporting has been stopped. If reporting has been stopped for all individual target msids and msid shall not be present.

If the tlrsr included an msid that was invalid the tlrsa shall include the result element.

Example

```
<tlrsa ver="3.5.0">
  <req_id>25293</req_id>
</tlrsa>
```

5.2.3.6.6 Triggered Location Reporting Pause Report DTD

```
<!-- MLP_TLRPR -->
<!--
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   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   tlrpr                    (msid, req_id, lcs_ref? %extension.param;)>
<!ATTLIST   tlrpr
            ver CDATA                #FIXED "3.5.0"
            cause (PAUSE | RESUME)   #REQUIRED>
```

The (optional) parameter 'lcs_ref' shall be sent to the LCS Client in case the Requesting Location Server receives it from Home Location Server.

Example

```
     <tlrpr ver="3.5.0" cause="PAUSE">
  <msid>461011678298</msid>
  <req_id>25293</req_id>
     </tlrpr>
```

5.2.3.6.7 Triggered Location Reporting Query Request DTD

```
<!-- MLP_TLRQR -->
<!--
MLP V3.5 Document Type Definition

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   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param          "">

<!ELEMENT   tlrqr                     (pushaddr? %extension.param;)>
<!ATTLIST   tlrqr
            ver CDATA                 #FIXED "3.5.0">
```

Example

```
      <tlrqr ver="3.5.0" >
       </tlrqr>
```

5.2.3.6.8 Triggered Location Reporting Query Answer DTD

```
<!-- MLP_TLRQA -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param          "">

<!ELEMENT   tlrqa                     ((query_id | (result, add_info?)) %extension.param;)>
<!ATTLIST   tlrqa
            ver CDATA                 #FIXED "3.5.0">
```

Example

```
<tlrqa ver="3.5.0" >
   <query_id>25293</query_id>
</tlrqa>
```

5.2.3.6.9 Triggered Location Query Report DTD

```
<!-- MLP_TLQREP -->
<!--
MLP V3.5 Document Type Definition

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   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   tlqrep                   (query_id, trigger_data* %extension.param;)>
<!ATTLIST   tlqrep
            ver CDATA                #FIXED "3.5.0"
            last (YES | NO)          #REQUIRED>
```

If there are no triggers to report the element “trigger_data” SHALL be absent.

Example

```
<tlqrep ver="3.5.0" last="YES">
  <query_id>25267</query_id>
  <trigger_data>
      <req_id>25283</req_id>
      <msid>461011678298</msid>
      <msid>461011678299</msid>
  </trigger_data>
  <trigger_data>
      <req_id>765192</req_id>
      <msid>461011678300</msid>
      <msid>461011678301</msid>
  </trigger_data>
</tlqrep>
```

5.2.3.7 General Error Message Definition

When an LCS client attempts to invoke a service not defined in this specification, the location server SHOULD return a General Error Message. Sending a general error message (GEM) is no proper solution by itself because it can not always be expected that the client will understand this (MLP) response message, since - by sending an invalid request - the client shows that it may not be familiar with the proper set of MLP services. So additional error indications MAY be described in the appropriate transport layer mappings.

```
<!-- MLP_GEM -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE gem PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <gem>
      ...
   </gem>

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-->

<!ELEMENT   gem                        (result, add_info?)>
<!ATTLIST   gem
            ver CDATA                  #FIXED "3.5.0">
```

Example

```
<gem ver="3.5.0">
  <result resid="108">SERVICE NOT SUPPORTED</result>
  <add_info>
    The server does not support a service named 'skir'
  </add_info>
</gem>
```

5.2.3.8 Historic Location Immediate Service

This is a service for requesting reporting of historic locations of one Mobile Subscriber.

When a large number of locations are to be reported, it may take an unacceptably long time before a response can be sent to the LCS Client. The LCS Client can thus indicate it allows the Location Server to send the location responses, either at the time of the response to the request, or individually using one or more connections initiated by the Location Server.

The service consists of the following messages:

- Historic Location Immediate Request
- Historic Location Immediate Answer
- Historic Location Immediate Report

The Historic Location Immediate Service SHALL consist of a Historic Location Immediate Request followed by one Historic Location Immediate Answer and zero, one or more OPTIONAL Historic Location Immediate Reports.

The following message flow as depicted in Figure 8 encapsulates this service:

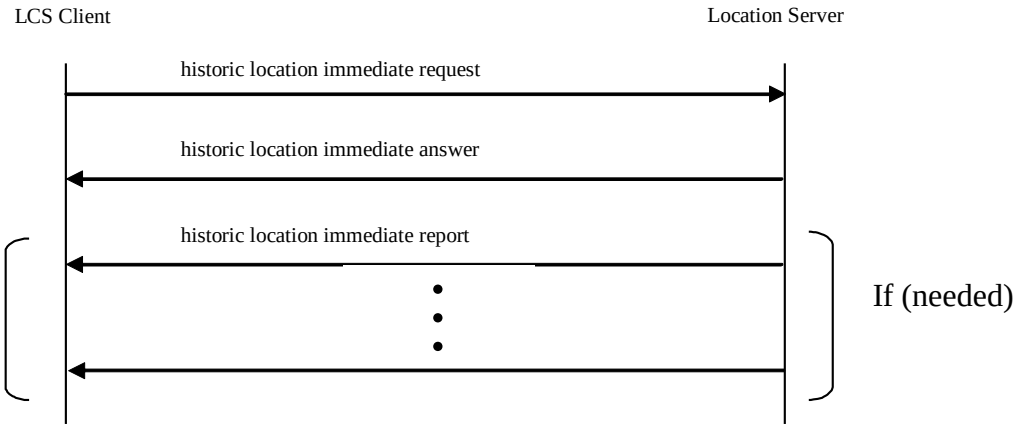

Figure 8: Message Flow for the Historic Location Immediate Service

5.2.3.8.1 Historic Location Immediate Request DTD

```
<!-- MLP_HLIR -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_init PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_init>
      ...
   </svc_init>

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-->

<!ENTITY    % extension.param          "">

<!ELEMENT   hlir                      (msid, trans_id?, start_time?, stop_time?, interval?, qop?,
                                      geo_info?, no_of_reports?, pushaddr?, prio?
                                      %extension.param;)>
<!ATTLIST   hlir
            ver CDATA                 #FIXED "3.5.0"
            res_type (SYNC | ASYNC)   "SYNC">
```

The following rules apply to the use of ‘start_time’, ‘stop_time’ and ‘interval’:

- INTERVAL indicates the minimum time interval between reported positions.
- If STOP_TIME is later than current time, then current time is assumed as stop time.
- If STOP_TIME is earlier than START_TIME then the implementation MUST reject the request with an error indication ‘110’ to the client.

Example

```
<hlir ver="3.5.0">
  <msid>461011678298</msid>
```

```
      <start_time utc_off="+0300">20021003112700</start_time>
    <stop_time utc_off="+0300">20021003152700</stop_time>
    <interval>00001000</interval>
    <qop>
      <hor_acc>1000</hor_acc>
    </qop>
    <geo_info>
      <CoordinateReferenceSystem>
        <Identifier>
          <code>4326</code>
          <codeSpace>EPSG</codeSpace>
          <edition>6.1</edition>
        </Identifier>
      </CoordinateReferenceSystem>
    </geo_info>
    <pushaddr>
      <url>http://location.application.com</url>
    </pushaddr>
    <prio type="HIGH" />
  </hlir>
```

5.2.3.8.2 Historic Location Immediate Answer DTD

```
<!-- MLP_HLIA -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   hlia                     ((pos+ | req_id | (result, add_info?)) %extension.param;)>
<!ATTLIST   hlia
            ver CDATA                #FIXED "3.5.0">
```

Example: HLIA for async request

```
  <tlra ver="3.5.0">
    <req_id>25293</req_id>
  </tlra>
```

5.2.3.8.3 Historic Location Immediate Report DTD

```
<!-- MLP_HLIREP -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result>

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-->

<!ENTITY    % extension.param         "">

<!ELEMENT   hlirep                   (req_id, pos+ %extension.param;)>
<!ATTLIST   hlirep
            ver CDATA                #FIXED "3.5.0">
```

Example 1: Successful historic location report

```
<hlirep ver="3.5.0">
  <req_id>25267</req_id>
  <pos>
    <msid>461011678298</msid>
    <pd>
      <time utc_off="+0300">20020813010423</time>
      <shape>
        <CircularArea srsName="www.epsg.org#4326">
          <coord>
            <X>35 35 24.139N</X>
            <Y>139 35 24.754E</Y>
          </coord>
          <radius>15</radius>
        </CircularArea>
      </shape>
    </pd>
  </pos>
  <pos>
    <msid>461011678298</msid>
    <pd>
      <time utc_off="+0300">20020813011423</time>
      <shape>
        <CircularArea srsName="www.epsg.org#4326">
          <coord>
            <X>35 36 13.482N</X>
            <Y>139 35 75.139E</Y>
          </coord>
          <radius>21</radius>
        </CircularArea>
      </shape>
    </pd>
  </pos>
</hlirep>
```

5.3 Elements and attributes in DTD

5.3.1 add_info

Description:	
A text string containing additional information about a certain result.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	<add_info>EVENT</add_info>
Note:	

5.3.2 aln_id

Description:	
This element specifies the Access Location Network Identity	
Type:	Element
Format:	Char string
Defined values:	-
Default value:	-
Example:	<aln_id type="SSID">MY_NETWORK</aln_id>
Note:	-

5.3.2.1 type

Description:	
Defines the type of the aln_id	
Type:	Attribute
Format:	Char string
Defined values:	SSID
	BSSID
	OTHER
Default value:	NA
Example:	
Note:	

5.3.3 amf_name

Description:	
This element defines the name of the target AMF.	
Type:	Element
Format:	Char String
Defined values:	FQDN
Default value:	
Example:	<amf_name>amf37.amf.5gc.mnc012.mcc345.3gppnetwork.org</amf_name>
Note:	

5.3.4 ln_node

Description:

This element specifies the Access Location Network Node	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<aln_node type=”WIFI” id_type=”MAC_ADDRESS”>FC:12:A0:75:C3:3B</aln_node>`
Note:	-

5.3.4.1 type

Description:	
Defines the type of the aln_node	
Type:	Attribute
Format:	Char string
Defined values:	WIFI
	BT
	SRN
	OTHER
Default value:	NA
Example:	
Note:	

5.3.4.2 id_type

Description:	
Defines the type of the aln_node	
Type:	Attribute
Format:	Char string
Defined values:	MAC_ADDRESS
	OTHER
Default value:	NA
Example:	
Note:	

5.3.5 alt

Description:	
The altitude of the MS in meters in respect of the ellipsoid which is used to be define the coordinates. When used for relative location, this parameter expresses the altitude relative to the Reference Point.	
Type:	Element
Format:	Char String
Defined values:	[+|-]?[0-9]+
Default value:	
Example:	`<alt>1200</alt>`
Note:	This element is present if altitude is possible to attain by the used positioning method.

5.3.6 alt_acc

Description:	
Accuracy of requested altitude in meters	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	`<alt_acc>200</alt_acc>`
Note:	

5.3.6.1 qos_class

Description:		
defines the degree of adherence by the Location Service to the quality of another quality of service parameter. In the MLP context this refers to the XML "parent" element, i.e alt_acc, hoc_acc, or ll_acc, resp.		
Type:	Attribute	
Format:	Char string	
Defined values:	ASSURED	defines the most stringent requirement on the accuracy achieved for a location request. If a location estimate obtained does not fulfil the 'alt_acc' requirements, then it shall be discarded and an appropriate error cause sent.
	BEST_EFFORT	defines the least stringent requirement on the QoS achieved for a location request. If a location estimate obtained does not fulfil the other QoS requirements, it should still be returned but with an appropriate indication that the requested QoS was not met. If no location estimate is obtained, an appropriate error cause is sent.
Default value:		
Example:	`<alt_acc qos_class="BEST_EFFORT">200</alt_acc>`	
Note:	For details see 3GPP TS 23.271, v6.8.0, clause 6.5.1	

5.3.7 alt_unc

Description:
Uncertainty of altitude estimate in meters
Type: Element
Format: Char String
Defined values: [0-9]+
Default value:
Example: `<alt_unc>200</alt_unc>`
Note:

5.3.8 analytic_data

Description:
Specifies the analytic data pertaining to an analytic report. It contains the time of the analytic data report, the number of MSs within the target area and the dwell time (mean and standard deviation).
Type: Element
Format: Char String
Defined values:
Default value:
Example:

`<analytic_data>`
`  <time>20140507150300</time>`
`  <num_of_ms>`
`  <num_entered>53</num_entered>`
`  <num_left>47</num_left>`
`  </num_of_ms>`
`  <dwell_time>`
`  <mean_dwell_time>00001000</mean_dwell_time>`
`  <dwell_time_std_dev>00000200</dwell_time_std_dev>`
`  </dwell_time>`
`</analytic_data>`

Note:

5.3.9 angle

Description:	
Specifies the angle (in angularUnit) of rotation of an ellipse measured clockwise from north	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	`<angle>24.30</angle>`
Note:	

5.3.10 angularUnit

Description:	
The angularUnit defines the unit for any angular value used in the shape description. For example the startAngle value in the CircularArcArea will be defined by this unit. If this unit is not included in a shape definition the angular unit defined in the CRS SHALL be used.	
Type:	Element
Format:	Char String
Defined values:	Degrees
	Radians
Default value:	Degrees
Example:	`<angularUnit>Degrees</angularUnit>`
Note:.	

5.3.11 Applicationid

Description:	
This element contains the application information for the incoming request	
Type:	Element
Format:	
Defined values:	
Default value:	
Example:	`<applicationid appProvider="TheAppProvider" appName="Fleet Tracker" appVersion="3.1.2" />`
Note:	

5.3.11.1 appProvider

Description:	
This attribute contains the application provider name	
Type:	Attribute
Format:	Char String
Defined values:	1 – 24 characters
Default value:	
Example:	`See applicationid element`
Note:	

5.3.11.2 appName

Description:	
This attribute contains the application name	
Type:	Attribute
Format:	Char String
Defined values:	1 – 32 characters
Default value:	
Example:	`See applicationid element`
Note:	

5.3.11.3 appVersion

Description:	
This attribute contains the version of the application	
Type:	Attribute
Format:	Char String
Defined values:	1 – 8 characters
Default value:	
Example:	`See applicationid element`
Note:	

5.3.12 Base64Map

Description:	
This element contains the content of a map image.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	`<Base64Map>iVBORwAANSUhEUg II=</Base64Map>`
Note:	The map image data is encoded as “based 64 encoded string”

5.3.13 batch_cond

Description:	
Defines the condition when to execute batch reporting	
Type:	Element
Format:	Char String
Defined values:	1 – 1024 if type is measurements, 1 – 2048 if type is minutes.
Default value:	-
Example:	`<batch_cond batch_type="MEASUREMENTS"> 500 </batch_cond>`
Note:	

5.3.13.1 batch_type

Description:		
Defines the type of batch condition.		
Type:	Attribute	
Format:	Char string	
Defined values:	MEASUREMENTS	Location reports shall be sent when specified number of measurements have executed
	MINUTES	Location reports shall be sent when specified number minutes has elapsed.
	ENDOFSERVICE	Location report shall be sent when sevice terminates. Any value in element batch_cond is disregarded
Default value:	CURRENT	
Example:	`<batch_cond batch_type="MEASUREMENTS"> 500 </batch_cond>`	
Note:		

5.3.14 Box

Description:	
The Box element is used to encode extents	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<Box srsName="www.epsg.org#4326" gid="some_thing">`
	`  <coord>`
	`  <X>30 27 45.3N</X>`
	`  <Y>45 25 52.9E</Y>`
	`  </coord>`
	`  <coord>`
	`  <X>31 27 45.3N</X>`
	`  <Y>46 25 52.9E</Y>`
	`  </coord>`
	`</Box>`

Note:	

5.3.14.1 gid

Description:	
The gid is of XML attribute type ID and is used for references to elements within a single XML document. It allows XML technologies such as XPointer and xref to be used.	
Type:	Attribute
Format:	Char String
Defined values:	
Default value:	
Example:	
Note:	This attribute is optional and is on all shape elements

5.3.14.2 srsName

Description:	
srsName is a short hand method of defining the CoordinateReferenceSystem. It is a URI datatype that contains the codeSpace and code values, which are defined in the same way as in the CoordinateReferenceSystem.	
Type:	Attribute
Format:	Char String
Defined values:	
Default value:	www.epsg.org/#4326
Example:	
Note:	This attribute is optional and is on all shape elements. If the srsName is not included the WGS84 CRS SHOULD be assumed.

5.3.15 cc

Description:	
Specifies the country code.	
Type:	Element
Format:	Char String
Defined values:	1-3 digits e.g. 355 for Albania
Default value:	
Example:	`<cc>355</cc>`
Note:	

5.3.16 cellid

Description:	
Identifies the Cell Identity	
Type:	Element
Format:	Char String
Defined values:	0-65535
Default value:	
Example:	`<cellid>546</cellid>`
Note:	

5.3.17 change_area

Description:	
Specifies the event that initiated the positioning of the MS	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<change_area type="MS_ENTERING" loc_estimates="TRUE">`
	`  <target_area>`
	`  <name_area>Seoul</name_area>`
	`  </target_area>`
	`</change_area>`

Note:	

5.3.17.1 type

Description:	
Specifies the trigger that initiated the positioning of the MS	
Type:	Attribute
Format:	Char string
Defined values:	MS_ENTERING
	MS_LEAVING
	MS_WITHIN_AREA
	MS_OUTSIDE_AREA
Default value:	
Example:	
Note:	

5.3.17.2 loc_estimates

Description:	
Specifies whether location estimates is required or not	
Type:	Attribute
Format:	Char string
Defined values:	TRUE
	FALSE
Default value:	
Example:	
Note:	

5.3.18 CircularArcArea

Description:	
An arc is defined by a point of origin with one offset angle and one uncertainty angle plus one inner radius and one uncertainty radius.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<CircularArcArea srsName="www.epsg.org#4326" gid="some_thing">`
	`  <coord>`
	`  <X>30 27 45.3N</X>`
	`  <Y>45 25 52.9E</Y>`
	`  </coord>`
	`  <inRadius>280</inRadius>`
	`  <outRadius>360</outRadius>`
	`  <startAngle>5</startAngle>`
	`  <stopAngle>240</stopAngle>`
	`</CircularArcArea>`

Note:	

5.3.18.1 gid

See section 5.3.14.1.

5.3.18.2 srsName

See section 1.1.1.1.

5.3.19 CircularArea

Description:	
The set of points on the ellipsoid, which are at a distance from the point of origin less than or equal to "r". When used for relative location, the coordinates of the origin are expressed relative to the Reference Point.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<CircularArea srsName="www.epsg.org#4326" gid="some_thing">`
	`  <coord>`
	`  <X>30 27 45.3N </X>`
	`  <Y>45 25 52.9E</Y>`
	`  </coord>`
	`  <radius>240</radius>`
	`</CircularArea>`

Note:	

5.3.19.1 gid

See section 5.3.14.1.

5.3.19.2 srsName

See section 1.1.1.1.

5.3.20 civicloc_element

Description:	
Specifies one element in a civic location. A civic location (civicloc) consists of one or more civicloc_element. If one instance of civicloc_element has attribute element_type="IANA" and the attribute iana_type is unknown, this instance of civicloc_element SHALL be discarded.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<civicloc_element element_type="COUNTRY">US</civicloc_element>`
Note:	

5.3.20.1 element_type

Description:	
Specifies the type of element an civicloc_element contains.	
Type:	Attribute
Format:	Char string
Defined values:	As defined in [RFC 4119], [RFC 5139], [RFC 6848], [IANA] and VENUE_NAME, VENUE_ID, VENUE_SPECIFIC_NAME and IANA. If element_type=”VENUE_NAME”, civicloc_element refers to the name of a venue. If element_type=”VENUE_ID”, civicloc_element refers to the venue id. If element_type=”VENUE_SPECIFIC_NAME”, civicloc_element refers to a venue specific name. If element_type=”IANA”, the type of the element is specified by the attribute “iana_type”.
Default value:	

Example:	`<civicloc>`
	`<civicloc_element element_type="COUNTRY">US</civicloc_element>`
	`<civicloc_element element_type=”A1”>California</civicloc_element>`
	`<civicloc_element element_type=”A2”>San Mateo County</civicloc_element>`
	`<civicloc_element element_type=”A3”>Menlo Park”</civicloc_element>`
	`<civicloc_element element_type=”VENUE_NAME”>Great Mall </civicloc_element>`
	`<civicloc_element element_type=”VENUE_SPECIFIC_NAME”>My little store`
	`</civicloc_element>`
	`</civicloc>`

5.3.20.2 iana_type

Description:	
Specifies the type of element an civicloc_element contains.	
Type:	Attribute
Format:	Char string
Defined values:	Values as defined in IANA Civic AddressTypes Registry [IANA] except values defined in attribute “element_type”.
Default value:	
Example:	<civicloc> <civicloc_element element_type="COUNTRY">US</civicloc_element> <civicloc_element element_type=”A1”>California</civicloc_element> <civicloc_element element_type=”A2”>San Mateo County</civicloc_element> <civicloc_element element_type=”A3”>Menlo Park”</civicloc_element> <civicloc_element element_type=”IANA” iana_type=”TBD”>Not yet defined address info</civicloc_element> </civicloc>
Note:	Attribute SHOULD only be present if atttribute element_type=”IANA”,

5.3.21 code

Description:	
This is the unique identifier for the Coordinate ReferenceSystem as used by the authority cited in codeSpace	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	<code>4326</code>
Note:	

5.3.22 codeSpace

Description:	
The codeSpace is the authority, which is responsible for the definition of the coordinate reference systems.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	www.epsg.org/...
Example:	<codeSpace>EPSG</codeSpace>
Note:	

5.3.23 codeword

Description:	
Codeword is an access code defined per MS, used to protect location information of MS against unwanted location request. Only location requests with the correct codeword of a target MS are accepted.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	`<codeword>0918a7cb</codeword>`
Note:	An error SHALL be returned if the number of codewords is not equal to the number of msids in an msid_range.

5.3.24 Confidence

Description:	
This element represents the confidence of a motionstate or a set of motionstates. The use and values are defined in LPPe [LPPe].	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<Confidence> 75 </Confidence>`
Note:	

5.3.25 diameter_realm

Description:	
This element defines the realm of a Diameter target_serving_node.	
Type:	Element
Format:	Char String
Defined values:	fqdn
Default value:	
Example:	`<diameter_realm>operatorname.pub.3gppnetwork.org</diameter_realm>`
Note:	

5.3.26 direction

Description:	
Specifies the direction of movement (in degrees) of a positioned MS	
Type:	Element
Format:	Char String
Defined values:	0-360
Default value:	
Example:	`<direction>120</direction>`
Note:	This element is present if direction is possible to attain by the used positioning method.

5.3.27 distance_event

Description:	
Specifies a distance event in triggered location reporting service	
Type:	Element
Format:	
Defined values:	
Default value:	
Example:	<distance_event type="ABOVE"> <reference_object> <msid>461011678298</msid> </reference_object> </distance_event>
Note:	

5.3.27.1 type

Description:		
Specifies the trigger criteria that will initiate reporting of the MS. Reporting will be initiated when any of the distances between target MS and reference object fulfills the criteria.		
Type:	Attribute	
Format:	Char string	
Defined values:	ENTERING_DISTANCE	Reporting performed each time the distance decreases below the target distance provided the minimum time between reports has elapsed. When the trigger is initiated it is assumed that the distance is above the target distance.
	LEAVING_DISTANCE	Reporting performed each time the distance increases above the target distance provided the minimum time between reports has elapsed. When the trigger is initiated it is assumed that the distance is below the target distance.
	WITHIN_DISTANCE	Reporting performed when distance is below the target distance provided the minimum time between reports has elapsed.
	OUTSIDE_DISTANCE	Reporting performed when distance is above the target distance provided the minimum time between reports has elapsed.
Default value:		
Example:		
Note:		

5.3.27.2 loc_estimates

See section 1.1.1.1.

5.3.28 distanceUnit

Description:	
The distanceUnit defines the linear unit for any distance used in the shape description. For example the radius value in the CircularArea will be defined by this unit. If this unit is not included in a shape definition the distance unit defined in the CRS SHOULD be used.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	meter
Example:	`<distanceUnit>surveyfoot</distanceUnit>`
Note:	values are defined by the CRS authority

5.3.29 duration

Description:	
A string defining the time range of triggered location reporting service.	
Type:	Element
Format:	Char String The time is expressed as ddhhmmss where: String: Description dd: Day hh: Hours mm: Minutes ss: Seconds
Defined values:	
Default value:	
Example:	`<duration>00001000</duration>`
Note:	

5.3.30 dwell_time

Description:	
The dwell time is used in the context of analytic events and represents the time MSs spent within the target area pertaining to an analytic report. The dwell time is expressed as the mean of the dwell time distribution (and optional standard deviation) of an ensemble of MSs that were within the target area during an analytic report data collection time interval.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	

Example:	`<dwell_time>`
	`  <mean_dwell_time>00001000</mean_dwell_time>`
	`  <dwell_time_std_dev>00000200</dwell_time_std_dev>`
	`</dwell_time>`

Note:	The data format of dwell_time is the same as that of duration.

5.3.31 dwell_time_std_dev

Description:	
The dwell time standard deviation indicates the standard deviation of the dwell time distribution of an ensemble of MSs that were within the target area during an analytic report data collection time interval.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	`<dwell_time_std_dev>00000200</dwell_time_std_dev>`
Note:	The data format of dwell_time_std_dev is the same as that of duration.

5.3.32 edition

Description:	
The edition defines which version of the CRS database defined by the codeSpace authority is used.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	`<edition>6.0</edition>`
Note:	

5.3.33 EllipticalArea

Description:	
A set of points on the ellipsoid, which fall within or on the boundary of an ellipse. This ellipse has a semi-major axis of length r1 oriented at angle A (0 to 180°) measured clockwise from north and a semi-minor axis of length r2. When used for relative location, the coordinates of the origin are expressed relative to the Reference Point.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<EllipticalArea srsName="www.epsg.org#4326" gid="some_thing">`
	`  <coord>`
	`  <X>30 27 45.3N</X>`
	`  <Y>45 25 52.9E</Y>`
	`  </coord>`
	`  <angle>240</angle>`
	`  <semiMajor>275</semiMajor>`
	`  <semiMinor>150</semiMinor>`
	`  <angularUnit>degrees</angularUnit>`
	`</EllipticalArea>`

Note:	

5.3.33.1 gid

See section 5.3.14.1.

5.3.33.2 srsName

See section 1.1.1.1.

5.3.34 eme_event

Description:	
Specifies the events that initiated the positioning of the MS at an emergency call.	
Type:	Element
Format:	
Defined values:	
Default value:	
Example:	<eme_event eme_trigger="EME_ORG"> <eme_pos pos_method=”A-GPS”> <msid>4711</msid> <poserr> <result resid="1">SYSTEM FAILURE</result> <time utc_off="0200">20040617144558</time> </poserr> </eme_pos> </eme_event>
Note:	

5.3.34.1 eme_trigger

Description:		
Specifies the trigger that initiated the positioning of the MS at an emergency call.		
Type:	Attribute	
Format:	Char string	
Defined values:	EME_ORG	An emergency service user originated an emergency call
	EME_REL	An emergency service user released an emergency call
	EME_HO	An emergency call is being handed over to a new serving node
Default value:		
Example:		
Note:		

5.3.35 eme_pos

Description:	
Specifies the position of the MS in an emergency location service response.	
Type:	Element
Format:	
Defined values:	
Default value:	
Example:	<eme_pos pos_method="A-GPS"> <msid>4711</msid> <poserr> <result resid="1">SYSTEM FAILURE</result> <time utc_off="0200">20040617144558</time> </poserr> </eme_pos>
Note:	

5.3.35.1 pos_method

Description:		
Specifies the positioning method used to obtain the associated location estimate		
Type:	Attribute	
Format:	Char string	
Defined values:	CELL	Cell coverage based positioning method
	OTDOA	Observed Time Difference of Arrival (OTDOA) positioning method
	GPS	Global Positioning System (GPS) based positioning method
	A-GPS	Assisted GPS based positioning method
	GNSS	GNSS (GPS and GANSS) based positioning method
	A-GNSS	Assisted GNSS (GPS and GANSS) based positioning method
	E-OTD	Enhanced Observed Time Difference (E-OTD) positioning method
	U-TDOA	Uplink Time Difference of Arrival (U-TDOA) positioning method
	AFLT	Advanced Forward Link Triangulation positioning method
	EFLT	Enhanced Forward Link Triangulation positioning method
	E-CID	Enhancement Cell ID positioning method
	BARO	Barometric Sensor positioning method
	BT	Bluetooth positioning method
	MBS	Metropolitan Beacon System positioning method
	WLAN	WLAN positioning method
	UNKNOWN	Unknown positioning method
	OTHER	Any other positioning method
Default value:		
Example:	`<eme_pos pos_method="A-GPS"> … </eme_pos>`	
Note:	The list of current values reflects the status quo described in 3GPP TS 23.271, V6.7.0, sect. 4.3 (plus A-GPS) and TIA-801. New values may be added as soon as the need arises.	

5.3.36 esrd

Description:	
This element specifies Emergency Services Routing Digits (ESRD).	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<esrd>761287612582</esrd>`
Note:	

5.3.36.1 type

Description:		
Defines the origin of the ESRD		
Type:	Attribute	
Format:	Char string	
Defined values:	NA	Indicates that the ESRD is defined as the North American ESRD (NA-ESRD).NA-ESRD is a telephone number in the North American Numbering Plan that can be used to identify a North American emergency services provider and it's associated Location Services client. The NA-ESRD also identifies the base station, cell site or sector from which a North American emergency call originates
	LOCAL	Indicates that the ESRD has a local definition agreed between Location Server and LCS Client. This value shall be used when ESRD is used outside North America.
Default value:	NA	
Example:	`<esrd type="NA">12345678</esrd>`	
Note:		

5.3.37 esrk

Description:	
This element specifies the Services Routing Key (ESRK).	
Type:	Element
Format:	Char string
Defined values:	-
Default value:	-
Example:	`<esrk>928273633343</esrk>`
Note:	-

5.3.37.1 type

Description:		
Defines the origin of the ESRK		
Type:	Attribute	
Format:	Char string	
Defined values:	NA	Indicates that the ESRK is defined as the North American ESRK (NA-ESRK).NA-ESRK is a telephone number in the North American Numbering Plan that is assigned to an emergency services call for the duration of the call. The NA-ESRK is used to identify (e.g. route to) both the emergency services provider and the switch currently serving the emergency caller. During the lifetime of an emergency services call, the NA-ESRK also identifies the calling subscriber.
	LOCAL	Indicates that the ESRK has a local definition agreed between Location Server and LCS Client. This value shall be used when ESRK is used outside North America.
Default value:	NA	
Example:	`<esrk type="NA">12345678</esrk>`	
Note:		

5.3.38 equidistance_event

Description:	
Specifies an equidistance event in triggered location reporting service	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<equidistance_event type="ENTERING_TARGET_EQUIDISTANCE">`
	`  <target_equidistance>30000</target_equidistance>`
	`</equidistance_event>`

Note:	

5.3.38.1 loc_estimates

See section 1.1.1.1.

5.3.39 floor_number

Description:	
Identifies the floor number (zero meaning ground level)	
Type:	Element
Format:	Char string
Defined values:	[0-9], [.], [-]
Default value:	
Example:	`<floor_number>8</floor_number>` `This means the floor is 8 levels above the ground level.`
Note:	0 means ground level or same as Reference Point for relative location. Fractional floor numbers are allowed. A negative floor number indicates a floor below ground level (or below Reference Point for relative location) while a positive floor number indicates a floor above ground level (or above Reference Point for relative location).

5.3.40 floor_number_unc

Description:	
Identifies the floor number uncertainty (in units of floors)	
Type:	Element
Format:	Char string
Defined values:	[0-9], [.]
Default value:	
Example:	`<floor_number_unc>0.7</floor_number_unc>` `This means the floor number uncertainty is 0.7.`
Note:	

5.3.41 group_condition

Description:	
This element specifies the group condition element in tlrr_event. The group_condition element can be an absolute value or a relative value and defines the threshold level for when the group_condition is fulfilled. If attribute threshold_type is "ALL" the element may be empty and any value will have no effect.	
Type:	Element
Format:	Char string
Defined values:	-
Default value:	-
Example:	`<group_condition threshold_type=”ALL”></group_condition>`
Note:	-

5.3.41.1 threshold_type

Description:	
Defines the type of group condition	
Type:	Attribute
Format:	Char string
Defined values:	ALL – for the trigger_event to be reported, all members of the group of target MSs must fulfill the trigger condition. Example: all members of a group are within the target area.
	MINIMUM – for the trigger_event to be reported, at least a minimum number of target MSs (specified in group_condition) must fulfill the trigger condition. Example: at least 10 members of the group are within the target area (in this example it is assumed that value_type=”ABSOLUTE”).
	MAXIMUM - for the trigger_event to be reported, no more than a maximum number of target MSs (specified in group_condition) must fulfill the trigger condition. Example: 10 or less members of the group are within the target area (in this example it is assumed that value_type=” ABSOLUTE”).
Default value:	ALL
Example:	`< group_condition threshold_type=”MINIMUM”>10</group_condition>`
Note:	

5.3.41.2 value_type

Description:	
Defines the type of group condition	
Type:	Attribute
Format:	Char string
Defined values:	RELATIVE – the value of the minimum or maximum number of target MSs (specified in group_condition) is given as a decimal percentage between 0 and 100 of the total number of members in the group). Example: at least 10% of the members of the group are within the target area.
	ABSOLUTE - the value of the minimum or maximum number of target MSs (specified in group_conditions) is given as an absolute number. Example: at least 10 members of the group are within the target area.
Default value:	ABSOLUTE
Example:	< group_condition threshold_type=”MINIMUM” value_type=”RELATIVE”>50</group_condition>
Note:	The value_type is only applicable if the threshold_type is not “ALL”

5.3.42 Height

Description:	
This element specifies the requested height of map image	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	0
Example:	`<Height>600</Height>`
Note:	The default type of map height is defined as pixel.

5.3.43 Hemisphere

Description:		
first and the mandatory component in the representation of a location in UTM coordinate system		
Type:	Element	
Format:	Char string	
Defined values:	NORTH	It specifies the zone in the north of the equator
	SOUTH	It specified the zone in the south of the equator
Default value:		
Example:	`<Hemisphere>NORTH</Hemisphere>`	
Note:	Stands for Hemisphere of a position in UTM Coordinate System.	

5.3.44 hor_acc

Description:	
Horizontal accuracy in meters	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	`<hor_acc>200</hor_acc>`
Note:	

5.3.44.1 qos_class

See section 1.1.1.1

5.3.45 id

Description:	
A string defining the name of a registered user performing a location request. In an answer the string represents the name of a location server.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<id>TheTruckCompany</id>`
Note:	This element is implementation specific.

5.3.46 imsi

Description:	
The International Mobile Subscriber Identity number as specified in 3GPP TS 23.003 and ITU-T E212 Recommendation.	
Type:	Element
Format:	Char String
Defined values:	-
Default value:	-
Example:	`<imsi>123456789012345</imsi>`
Note:	-

5.3.47 inRadius

Description:	
The inner radius is the geodesic distance (in distannceUnit) between the center of the circle (that the arc is a part of) and the arc closest to the center	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	`<inRadius>100</inRadius>`
Note:	If the inner radius is 0 (zero) the area described represents a sector of a circle.

5.3.48 interval

Description:		
Specifies the interval between two responses in case of a TLRR indicating timer controlled, periodic responses or minimum interval between reported positions in case of HLIR.		
Type:	Element	
Format:	Char string The interval is expressed as ddhhmmss where:	
	String	**Description**
	dd	Number of days between responses
	hh	Number of hours between responses
	mm	Number of minutes between responses
	ss	Number of seconds between responses
Defined values:		
Default value:		
Example:	`<interval>00010000</interval>`	
Note:		

5.3.49 ip_address

Description:	
This element represents an identifier of the IP address used by a terminal.	
Type:	Element
Format:	Char string
Defined values:	As per [RFC796] IPV4 or [RFC3513] IPV6
Default value:	
Example:	`<ip_address>147.211.234.10</ip_address>`
Note:	

5.3.50 lac

Description:	
Identifies the Location Area Code	
Type:	Element
Format:	Char String
Defined values:	1-65535
Default value:	
Example:	`<lac>234</lac>`
Note:	Location Area Code (LAC) is a fixed length code (of 2 octets) identifying a location area within a GSM PLMN. This part of the location area identification can be coded using a full hexadecimal representation, except for the following reserved hexadecimal values: 0000, and FFFE

5.3.51 lcs_ref

Description:	
The LDR reference number received from Home Location Server. For more information see [23.271]	
Type:	Element
Format:	Char String
Defined values:	Two decimal digits, 00-64
Default value:	-
Example:	`<lcs_ref>50</lcs_ref>`
Note:	Lcs_ref SHALL be sent in the triggered location reporting request with change of area event or MS_AVAIL event and combined triggered location reporting request with periodic event / MS_AVAIL event request case. The LDR reference number is received as one octet and shall be encoded to the decimal numbers 00 to 64.

5.3.52 lev_conf

Description:	
This parameter indicates the probability in percent that the MS is located in the position area that is returned.	
Type:	Element
Format:	Char String
Defined values:	0-100
Default value:	
Example:	`<lev_conf>80</lev_conf>`
Note:	

5.3.53 LinearRing

Description:	
A linear ring is a closed, simple piece-wise linear path which is defined by a list of coordinates that are assumed to be connected by straight-line segments. If the element is used in the construction of a Polygon the last coordinate MAY be different to the first coordinate, otherwise the last coordinate must be coincident with the first coordinate.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<LinearRing srsName="www.epsg.org#4326" gid="some_thing">`
	`  <coord>`
	`  <X>30 27 45.3N</X>`
	`  <Y>45 25 52.9E</Y>`
	`  </coord>`
	`  <coord>`
	`  <X>40 27 45.3N</X>`
	`  <Y>48 25 52.9E</Y>`
	`  </coord>`
	`  <coord>`
	`  <X>33 27 45.3N</X>`
	`  <Y>46 25 52.9E</Y>`
	`  </coord>`
	`  <coord>`
	`  <X>30 27 45.3N</X>`
	`  <Y>45 25 52.9E</Y>`
	`  </coord>`
	`</LinearRing>`

Note:	

5.3.53.1 gid

See section 5.3.14.1.

5.3.53.2 srsName

See section 1.1.1.1.

5.3.54 LineString

Description:	
A line string is a piece-wise linear path which is defined by a list of coordinates that are assumed to be connected by straight-line segments.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<LineString srsName="www.epsg.org#4326" gid="some_thing">`
	`  <coord>`
	`  <X>30 27 45.3N</X>`
	`  <Y>48 25 52.9E</Y>`
	`  </coord>`
	`  <coord>`
	`  <X>40 27 45.3N</X>`
	`  <Y>48 25 52.9E</Y>`
	`  </coord>`
	`  <coord>`
	`  <X>33 27 45.3N</X>`
	`  <Y>48 25 52.9E</Y>`
	`  </coord>`
	`</LineString>`

Note:	

5.3.54.1 gid

See section 5.3.14.1.

5.3.54.2 srsName

See section 1.1.1.1.

5.3.55 ll_acc

Description:	
Longitude and latitude accuracy in seconds.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	`<ll_acc>7.5</ll_acc>`
Note:	

5.3.55.1 qos_class

See section 1.1.1.1.

5.3.56 lmsi

Description:	
A local identity allocated by the VLR to a given subscriber for internal management of data in the VLR as defined in [29.002]	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	`<lmsi>234</lmsi>`
Note:	The LMSI consists of 4 octets

5.3.57 location_id

Description:	
This element represents a location identifier. The location identifier represents information about the current location of the target in the network. Location is indicated in network terms, for example using the line-id in fixed broadband networks	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<location_id>674vbdtzks</location_id>`

5.3.58 location_uri

Description:	
This element represents an URI that enables the current location of a target to be obtained from a particular location server. The definition of an Location URI is outside the scope of this document. Examples of requirements on generation and use of location URIs can be found in [RFC5808]	
Type:	Element
Format:	Char string
Defined values:	As defined in [RFC3986]
Default value:	
Example:	`<location_uri> https://location-sever.example.com:9211/bv674vbdtzks</ location_uri >`

5.3.59 uncompensatedBarometricPressure

Description:	
Specifies the uncompensated barometric pressure reported by the MS in units of Pa.	
Type:	Element
Format:	Char string
Defined values:	[0-9]+
Default value:	
Example:	`<uncompensatedBarometricPressure>101300</uncompensatedBarometricPressure>`
Note:	

5.3.60 loc_type

Description:	
Defines the type of location requested.	
Type:	Element
Format:	Void
Defined values:	
Default value:	
Example:	`<loc_type type="INITIAL" />`
Note:	

5.3.60.1 type

Description:		
Defines the type of location requested		
Type:	Attribute	
Format:	Char string	
Defined values:	CURRENT	After a location attempt has successfully delivered a location estimate and its associated time stamp, the location estimate and time stamp is known as the current location at that point in time.
	LAST	The current location estimate and its associated time stamp is generally stored in the network and is known as the last known location until replaced by a later location estimate and a new time stamp.The last known location may be distinct from the initial location, i.e., more recent.
	LAST_OR_CURRENT	If the last known location is stored in the network and if this location satisfies the Quality of Service requested by the location-based application the last known location is returned, otherwise the current location is returned.
	CURRENT_OR_LAST	If a location attempt has successfully delivered a current location, it is returned. Otherwise if the last known location stored in the network satisfies the requested Quality of service the last known location is returned.
	INITIAL	In an originating emergency call, the location estimate and the associated time stamp at the commencement of the call set-up is known as the initial location.
	CURRENT_AND _INTERMEDIATE	In addition to delivery of a final current location estimate (or error indication) the location server shall, if applicable, deliver one or more intermediate location estimates not fulfilling the QoP.
	LOCATION_URI	Instead of a location estimate an Location URI shall be delivered.
Default value:	CURRENT	
Example:	`<loc_type type="INITIAL" />`	
Note:		

5.3.60.2 per_type

Description:		
Defines the type of periodic location requested		
Type:	Attribute	
Format:	Char string	
Defined values:	REALTIME	Location Reports shall be sent to MLS Client at the requested interval independent if current position estimate is available or not.
	QUASIREALTIME	Location Reports shall be sent to MLS Client at the requested interval if current position estimates are available. If current position estimate is unavailable due to lack of communication with the target, no report shall be sent. If position estimates later becomes available they shall immediately be sent to MLS Client
	BATCH	Location Reports shall be sent to MLS Client when batch condition is fulfilled or when service is terminated.
Default value:	REALTIME	
Example:	`<loc_type per_type="BATCH" />`	
Note:		

5.3.61 lte_ci

Description:	
LTE Cell Identity. Details related to this parameter is found in [3GPP LTE]	
Type:	Element
Format:	Char string
Defined values:	
Default value:	-
Example:	`<lte_ci>54654</lte_ci>`
Note:	-

5.3.62 MapRequest

Description: Specifies the format of requested map information.	
The Map Request	
Type:	Element
Format:	Char String
Defined values:	
Default value:	

Example:	`<MapRequest MapdataType="MAP" MimeType="PNG">`
	`<Width>800</Width>`
	`<Height>600</Height>`
	`<Zoom ZoomType="KILOMETER">1</Zoom>`
	`</MapRequest>`

Note:	The map image is rendered by location server based on the MapRequest settings.

5.3.62.1 MapdataType

Description:		
This element specifies The the content type of Map data Request		
Type:	Attribute	
Format:	Char String	
Defined values:		
Default value:	MAP specifies the map image request.	
	URL specifies the request for the url address of map image .	
Example:		

5.3.62.2 MimeType

Description:		
This element specifies the mime type of map image		
Type:	Element	
Format:	Char String	
Defined values:	GIF	it specifies the image format designed by Generation IV International Forum
	JPEG	it specifies the image format designed by Joint Photographic Experts Group
	PNG	it specifies the image format designed by Portable Network Graphics
	TIFF	it specifys Tagged Image File Format
Default value:	PNG	
Example:		
Note:		

5.3.63 mean_dwell_time

Description:
The mean dwell time indicates the mean of the dwell time distribution of an ensemble of MSs that were within the target area during an analytic report data collection time interval.
Type: Element
Format: Char String
Defined values:
Default value:
Example: <mean_dwell_time>00001000</mean_dwell_time>
Note: The data format of mean_dwell_time is the same as that of duration.

5.3.64 minimumIntervalTime

Description:
The minimum interval in seconds between re-arming the trigger event trigger.
Type: Element
Format: Char string
Defined values: Maximum number of seconds (must be >= 0)
Default value: Implementation specific.
Example: <minimumIntervalTime>30</minimumIntervalTime>
Note: This element prevents flooding the LCS client with too many reports.

5.3.65 max_loc_age

Description:	
This states the maximum allowable age in seconds of a location sent as a response to a location request. This location information may have been cached somewhere in the system from a previous location update.	
Type:	Element
Format:	Char string
Defined values:	Maximum number of seconds (must be >= 0)
Default value:	Implementation specific.
Example:	`<max_loc_age>3600</max_loc_age>`
Note:	

5.3.66 mcc

Description:	
Specifies the mobile country code (MCC).	
Type:	Element
Format:	Char String
Defined values:	3 digits, e.g. 234 for the UK
Default value:	
Example:	`<mcc>234</mcc>`
Note:	

5.3.67 mme_name

Description:	
This element defines the name of the target MME.	
Type:	Element
Format:	Char String
Defined values:	fqdn
Default value:	
Example:	`<mme_name>mmename.operatorname.pub.3gppnetwork.org</mme_name>`
Note:	

5.3.68 mnc

Description:	
Specifies the mobile network code.	
Type:	Element
Format:	Char string
Defined values:	2 - 3 digits e.g. 15 for Vodafone
Default value:	
Example:	`<mnc>215</mnc>`
Note:	

5.3.69 MotionState

Description:	
This element represents a motionstate of the target. The values are defined in LPPe [LPPe].	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<MotionSate> pedestrian </MotionState>`
Note:	

5.3.70 MotionStateRequest

Description:	
Indication that motionstate information is requested.	
Type:	Element
Format:	Void
Defined values:	
Default value:	
Example:	
Note:	

5.3.71 ms_action

Description:	
Specifies the trigger that initiated the positioning of the MS.	
Type:	Element
Format:	Void
Defined values:	
Default value:	
Example:	`<ms_action type="MS_AVAIL" />`
Note:	

5.3.71.1 type

Description:		
Specifies the trigger that initiated the positioning of the MS.		
Type:	Attribute	
Format:	Char string	
Defined values:	MS_AVAIL	The positioning is triggered by the MS available notification when the MS regains radio connection with the network if the connection was previously lost. For more information refer to 3GPP [23.271].
Default value:		
Example:	`<ms_action type="MS_AVAIL" />`	
Note:		

5.3.72 msid

Description:	
This element represents an identifier of a mobile subscriber	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<msid type="IMSI" enc="ASC">460703057640</msid>`
Note:	When appropriate the MSID type format SHOULD confirm to the full standardised international representation of the MSID type, without any additional unspecified characters or spaces. As an example the GSM/3GPP identifiers SHOULD conform to 3GPP [23.003]

5.3.72.1 type

Description:		
Type of identifier for the mobile subscriber		
Type:	Attribute	
Format:	Char string	
Defined values:	MSISDN	Mobile Station International ISDN Number [23.003]
	IMSI	International Mobile Subscriber Identity [23.003], [J-STD-036]
	IMEI	International Mobile station Equipment Identity [23.003]
	MIN	Mobile Identification Number [IS-41D]
	MDN	Mobile Directory Number [IS-41D]
	EME_MSID	Emergency MSID
	ASID	Anonymous Subscriber Identity
	IPV4	Mobile station IP address (Version 4) [RFC796]
	OPE_ID	Operator specific Identity
	IPV6	Mobile station IP address (Version 6) [RFC3513]
	SESSID	Session identifier relating to the user, which MAY be anonymous
	SIP_URI	IMS Public User Identity (**S**ession **I**nitiation **P**rotocol **U**niform **R**esource **I**dentifier) [RFC 3261]
	TEL_URL	Telephone Uniform Resource Locator [RFC 2806]
	NAI	Network Access Identifier [RFC 4282]
	URI	Uniform Resource Identifier [RFC 3986]
	ANONYMOUS	The msid is anonymous i.e., does not reveal the identity of the mobile station. This attribute is reserved for location and/or event reporting and MUST NOT be used for location or event reporting requests.
	VENUE_ID	Venue specific Identity
	LOCATION_ID	The msid is a location identifier (see 5.3.57)
Default value:	MSISDN	
Example:		
Note:	For attribute type ANONYMOUS, the mobile device's true identity is not revealed in the msid. It is recommended that for msid type="VENUE_ID", the venue id be included at the start of the msid character string. Example: <msid type="VENUE_ID">VENUE_ID=0959 3045276481</msid>	

5.3.72.2 enc

Description:		
Type of encoding of MSID identifier for the mobile subscriber		
Type:	Attribute	
Format:	Char string	
Defined values:	ASC	Normal textual format
	CRP	Encrypted format: Can be used to protect target privacy by only proving the LCS client with an Encrypted MSID
Default value:	ASC	
Example:		
Note:		

5.3.73 msid_group

Description:	
This element represents an identifier of a group of mobile subscribers.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<msid_group>ALL</msid_group>`
Note:	

5.3.73.1 type

Description:		
Type of identifier for the msid_group		
Type:	Attribute	
Format:	Char string	
Defined values:	NONE	The msid group does not have an attribute.
	UNSPECIFIED	The msid group is unspecified i.e., the members of the group are not known by their msids.
	REGISTERED	The msid group is registered with the location server i.e., the members of the group are registered with the location server.
	UNREGISTERED	The msid group is unregistered with the location server i.e., the members of the group are not registered with the location server.
	VENUE	The msid_group is of type VENUE
Default value:	UNSPECIFIED	
Example:	`<msid_group type="UNSPECIFIED">` `<msid_group type=”VENUE”>ALL</msid_group>`	
Note:	The attributes of an msid group may be implicitly defined by its name. For instance the msid group ”Group XYZ” may have attributes which are implicitly known to the Location Server and the LCS Client (e.g., via prior configuration). In this case no attribute is required i.e., the attribute value would be “NONE”. It is recommended that for msid_group type=”VENUE”, the venue name be included at the start of the msid_group character string. Example: <msid_group type=”VENUE_ID”>VENUE_NAME=Marina High All Teachers</msid>	

5.3.74 MultiLineString

Description:	
A collection of line strings.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<MultiLineString srsName="www.epsg.org#4326" gid="some_thing">`
	`  <LineString>`
	`  ...`
	`  </LineString>`
	`</MultiLineString>`

Note:	

5.3.74.1 gid

See section 5.3.14.1.

5.3.74.2 srsName

see section 1.1.1.1.

5.3.75 MultiPoint

Description:	
A collection of points.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<MultiPoint srsName="www.epsg.org#4326" gid="some_thing">`
	`  <Point>`
	`  ...`
	`  </Point>`
	`</MultiPoint>`

Note:	

5.3.75.1 gid

See section 5.3.14.1.

5.3.75.2 srsName

See section 1.1.1.1.

5.3.76 MultiPolygon

Description:	
A collection of polygons.	
Type:	Element
Format:	
Defined values:	-
Default value:	-

Example:	`<MultiPolygon srsName="www.epsg.org#4326" gid="some_thing">`
	`  <Polygon>`
	`  ...`
	`  </Polygon>`
	`</MultiPolygon>`

Note:	

5.3.76.1 gid

See section 5.3.14.1.

5.3.76.2 srsName

See section 1.1.1.1.

5.3.77 name_area

Description:	
Specify the geopolitical name of area in change_area event.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	<name_area>Seoul</name_area>
Note:	

5.3.78 ndc

Description:	
Specifies the national destination code.	
Type:	Element
Format:	Char string
Defined values:	Variable length depending upon the requirements of the destination country.
Default value:	
Example:	<ndc>215</ndc>
Note:	

5.3.79 nmr

Description:	
Network specific measurement result for the target MS.	
Type:	Element
Format:	Char string
Defined values:	For examples see relevant standards documents.
Default value:	
Example:	
Note:	Measurement Results are encoded as 34 hexadecimal characters representing, 17 binary octets, in accordance with the Measurement Result information element described in [04.18].

5.3.80 no_of_reports

Description:	
Specify the maximum number of reports for a TLRR or HLIR request.	
Type:	Element
Format:	Char String
Defined values:	[1-9]+
Default value:	1
Example:	<no_of_reports>5</no_of_reports>
Note:	

5.3.81 nr_cr

Description:	
NR Cell Identity. Details related to this parameter is found in [3GPP NR] and [3GPP 38.413].	
Type:	Element
Format:	Char string
Defined values:	
Default value:	-
Example:	<nr_ci>546547</nr_ci>
Note:	-

5.3.82 num_entered

Description:	
Applicable to analytic reports only: specifies the number of MSs that entered the target area during a data collection interval.	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	
Note:	

5.3.83 num_left

Description:	
Applicable to analytic reports only: specifies the number of MSs that left the target area during a data collection interval.	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	
Note:	

5.3.84 num_mean

Description:	
Applicable to analytic reports only: specifies the average number of MSs that were within the target area during a data collection interval.	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	
Note:	

5.3.85 num_of_ms

Description:	
Specifies information regarding the number of MSs pertaining to an analytic report. It may include the number of MSs that are located within the target area at the start of the data collection interval and it includes the number of MSs that enter and leave the target area. It may also contain the mean number and standard deviation of MSs that were within the target area during the data collection interval.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	<num_of_ms> <num_start>10</num_start> <num_entered>53</num_entered> <num_left>47</num_left> </num_of_ms>
Note:	It is assumed that multiple entries and departures of the same MS will be counted as single event.

5.3.86 num_start

Description:	
Applicable to analytic reports only: specifies the number of MSs within the target area at the start of a data collection interval.	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	
Note:	

5.3.87 num_std_dev

Description:	
Applicable to analytic reports only: specifies the standard deviation of the number of MSs that were within the target area during a data collection interval.	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	
Note:	

5.3.88 outRadius

Description:	
The radius of a circle furthest away from the position in a CircularArcArea. The value is in the distanceUnit	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	<outRadius>120</outRadius>
Note:	

5.3.89 persistence

<table>
<tr><td colspan="2">Description:</td></tr>
<tr><td colspan="2">Defines the duration a trigger condition must have been continuously met before the trigger event is reported.</td></tr>
<tr><td>Type:</td><td>Element</td></tr>
<tr><td>Format:</td><td>Char String
The time is expressed as ddhhmmss where:
<table>
<tr><td>String</td><td>Description</td></tr>
<tr><td>dd</td><td>Days</td></tr>
<tr><td>hh</td><td>Hours</td></tr>
<tr><td>mm</td><td>Minutes</td></tr>
<tr><td>ss</td><td>Seconds</td></tr>
</table></td></tr>
<tr><td>Defined values:</td><td></td></tr>
<tr><td>Default value:</td><td>The default value is defined by the location server</td></tr>
<tr><td>Example:</td><td><persistence>00010000</persistence></td></tr>
<tr><td>Note:</td><td>A trigger condition is considered to no longer apply and the duration is reset to zero if the target no longer satisfies the trigger condition prior to expiration of the persistence duration.
Examples: MS enters and then leaves a target area prior to the persistence expiration; MS does not stay within a target area for the entire persistence duration; MS velocity increases above a threshold and then decreases below the threshold prior to persistence expiration.</td></tr>
</table>

5.3.90 plmn

Description:	
A unique identity of Public Land Mobile Network as defined in [23.003].	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	<plmn> <mcc>234</mcc> <mnc>215</mnc> </plmn>
Note:	

5.3.91 Point

Description:	
A geographic coordinate. When used for relative location the geographic coordinate is expressed relative to the Reference Point.	
Type:	Element
Format:	
Defined values:	
Default value:	
Example:	<Point srsName="www.epsg.org#4326" gid="some_thing"> <coord> <X>30 27 45.3N</X> <Y>45 25 52.9E</Y> </coord> </Point>
Note:	

5.3.91.1 gid

See section 5.3.14.1.

5.3.91.2 srsName

See section 1.1.1.1.

5.3.92 Polygon

Description:	
A connected surface. Any pair of points in the polygon can be connected to one another by a path. The boundary of the Polygon is a set of LinearRings. We distinguish the outer (exterior) boundary and the inner (interior) boundaries; the LinearRings of the interior boundary cannot cross one another and cannot be contained within one another.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<Polygon srsName="www.epsg.org#4326" gid="some_thing">`
	`  <outerBoundaryIs>`
	`  ...`
	`  </outerBoundaryIs >`
	`</Polygon>`

Note:	

5.3.92.1 gid

See section 5.3.14.1.

5.3.92.2 srsName

See section 1.1.1.1.

5.3.93 pos

Description:	
Specifies the position of the MS in an immediate location service response.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<pos>`
	`  <msid>4711</msid>`
	`  <poserr>`
	`  <result resid="1">SYSTEM FAILURE</result>`
	`  <time utc_off="0200">20040617143232</time>`
	`  </poserr>`
	`</pos>`

Note:	

5.3.93.1 pos_method

See section 1.1.1.1

5.3.93.2 result_type

Description:		
Defines the type of location result reported		
Type:	Attribute	
Format:	Char string	
Defined values:	INTERMEDIATE	The location estimate in the pos element is not deemed to fulfil the QoP and will be followed by an final location estimate.
	FINAL	The pos element contains the final location estimate or poserror.
Default value:	FINAL	
Example:	`<result_type="INTERMEDIATE" />`	
Note:		

5.3.94 positioning_data

Description:	
Specifies the positioning data associated with obtaining the associated location estimate, based on [29.171] and [25.413]	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<positioning_data>`
	`  <positioning_method> GNSS </positioning_method>`
	`  <positioning_mode> Conventional </positioning_mode>`
	`  <ganss_id> Galileo </ganss_id>`
	`</positioning_data>`

Note:	

5.3.94.1 positioning_method

Description:		
Specifies the positioning method used to obtain the associated location estimate		
Type:	Attribute	
Format:	Char string	
Defined values:	CELL	Cell coverage based positioning method
	OTDOA	Observed Time Difference of Arrival (OTDOA) positioning method
	GPS	Global Positioning System (GPS) based positioning method
	A-GPS	Assisted GPS based positioning method
	GNSS	GNSS (GPS and GANSS) based positioning method
	A-GNSS	Assisted GNSS (GPS and GANSS) based positioning method
	E-OTD	Enhanced Observed Time Difference (E-OTD) positioning method
	U-TDOA	Uplink Time Difference of Arrival (U-TDOA) positioning method
	AFLT	Advanced Forward Link Triangulation positioning method
	EFLT	Enhanced Forward Link Triangulation positioning method
	E-CID	Enhancement Cell ID positioning method
	BARO	Barometric Sensor positioning method
	BT	Bluetooth positioning method
	MBS	Metropolitan Beacon System positioning method
	WLAN	WLAN positioning method
	UNKNOWN	Unknown positioning method
	OTHER	Any other positioning method
Default value:		
Example:	`<positioning_method> GNSS </positioning_method>`	
Note:		

5.3.94.2 positioning_mode

Description:	
This element specifies positioning mode used in the associated location estimate	
Type:	Attribute
Format:	Char string
Defined values:	UE-BASED, UE-ASSISTED, CONVENTIONAL
Default value:	
Example:	`<positioning_mode> Conventional </positioning_mode>`
Note:	Conventional mode may also be referred to as Standalone mode.

5.3.94.3 ganss_id

Description:		
Specifies the GANSS identifier used to obtain the associated location estimate		
Type:	Attribute	
Format:	Char string	
Defined values:	GALILEO	Galileo positioning method
	SBAS	Satellite Based Augmentation System positioning method
	MODERNIZED-GPS	Modernized-GPS positioning method
	QZSS	Quasi-Zenith Satellite System positioning method
	GLONASS	GLObal'naya NAvigatsionnaya Sputnikovaya Sistema positioning method
	BDS	BeiDou Navigation Satellite System positioning method
	UNKNOWN	Unknown GANSS positioning method
	OTHER	Any other GANSS positioning method
Default value:		
Example:	`<ganss_id> Galileo </ganss_id>`	
Note:		

5.3.95 prio

Description:
Defines the priority of a location request
Type: Element
Format: Void
Defined values:
Default value:
Example: `<prio />`
Note:

5.3.95.1 type

Description:		
Defines the priority of a location request		
Type:	Attribute	
Format:	Char string	
Defined values:	NORMAL	The request is handled with normal priority
	HIGH	The request is handled with high priority
Default value:	NORMAL	
Example:	`<prio type="HIGH" />`	
Note:		

5.3.96 pwd

Description:	
The password for the registered user performing a location request. In this answer the string represents the password for a location server.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<pwd>the5pwd</pwd>`
Note:	

5.3.97 qos_not_met

Description:	
Indication that the requested QoS was not met, if needed.	
Type:	Element
Format:	Void
Defined values:	
Default value:	
Example:	
Note:	Only applicable if the request was for best effort class, i.e. a location estimate is returned (rather than an error) although the requested QoS requirement could not be fulfilled.

5.3.98 query_id

Description:	
Unique identification of a triggered location reporting query request	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<query_id>435.23.01</query_id>`
Note:	

5.3.99 radius

Description:	
The uncertainty radius is the radius (in distanceUnit) of the uncertainty; this is the geodesic distance between the arc and the position point.	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	`<radius>850</radius>`
Note:	

5.3.100 reference _object

Description:	
Specifes the reference object in distance_event event.	
Type:	Element
Format:	Void
Defined values:	
Default value:	

Example:	`<reference_object>`
	`  <msid>461011678298</msid>`
	`</reference_object>`

Note:	

5.3.100.1 msid

See section 5.3.72.

5.3.101 ReferencePoint

Description:	
A Reference Point to be used for reporting and/or requesting a position.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	

Example:	`<ReferencePoint referencepoint_id="123456" referencepoint_name="Ref_Point A">`
	`  <Point srsName="www.epsg.org#4326" gid="some_thing">`
	`  <coord>`
	`  <X>30 27 45.3N</X>`
	`  <Y>45 25 52.9E</Y>`
	`  </coord>`
	`  </Point>`
	`</ReferencePoint>`

Note:	Reference Point is used for requesting/reporting a location relative to the Reference Point.

5.3.101.1 referencepoint_id

Description:	
This attribute represents a numeric representation of a reference point id	
Type:	Attribute
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	
Note:	

5.3.101.2 referencepoint_name

Description:	
This attribute represents a alphanumeric representation of a reference point name	
Type:	Attribute
Format:	Char String
Defined values:	
Default value:	
Example:	
Note:	

5.3.102 req_id

Description:	
Unique identification of a request	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<req_id>435.23.01</req_id>`
Note:	

5.3.103 requested_positiondata

Description:		
Defines the types of location info that is requested in location responses.		
Type:	Attribute	
Format:	Char string	
Defined values:	SHAPE	The returned positiondata should include a shape element
	CIVICLOC	The returned positiondata should include a civicloc element
	SHAPE_AND _CIVICLOC	The returned positiondata should include a shape and a civicloc element
Default value:	SHAPE	
Example:	`<geoinfo shape_requested="SHAPE"></geoinfo>`	
Note:		

5.3.104 requestmode

Description:	
Defines the type of the service that has been requested by the ASP.	
Type:	Element
Format:	Void
Defined values:	
Default value:	
Example:	`<requestmode type="ACTIVE"/>`
Note:	If the request mode is 'ACTIVE', the session element is included in msids of location request. The session element can be used as a credential by the Location Server or underlying network to verify that the request is actually 'ACTIVE'. One example of this can be that the network verifies the number the target has dialed that is presented by the MLS Client in the session element. The session element is either the number called by the UE for a call related location request or the APN on which the UE established the session for a session related location request according to [23.271]. The LCS Client determines whether the LCS service request is call/session related or not.

5.3.104.1 type

Description:		
Defines the type of the service that has been requested by the ASP		
Type:	Attribute	
Format:	Char string	
Defined values:	PASSIVE	The service is one that is not directly initiated by the user.
	ACTIVE	The service is one that the user is initiating personally.
Default value:	PASSIVE	
Example:	`<requestmode type="ACTIVE" />`	
Note:	The default value is set to PASSIVE, as this is likely to be the one that is most restrictively defined by the user.	

5.3.105 requestor

Description:	
This element describes the originating entity which has requested the location of the target MS from the MLS client.	
Type:	Element
Format:	Compound
Defined values:	
Default value:	n/a

Example:	`<requestor>`
	`  <id>08154711</id>`
	`</requestor>`

Note:	

5.3.105.1 type

Description:		
This attribute represents the type of the requestor identifier		
Type:	Attribute	
Format:	Char String	
Defined values:	NAME	Logical name
	MSISDN	MSISDN
	IMSI	IMSI
	E-MAIL	E-mail address
	URL	URL
	SIPURL	SIP URL
	IMS	IP multimedia subsystem public identity
	MDN	MDN
	ASID	ASID
	ASPID	Logical name of an Application Service Provider that is associated with the Client or Subclient .
Default value:	MSISDN	

Example:	`<requestor type="SIPURL">`
	`  <id>sip:+1-212-555-1212:1234@gateway.com;user=phone</id>`
	`  <serviceid>4711</serviceid>`
	`</requestor>`	

Note:	References to the definition and the format of each of these types ,except ASPID, can be found in [23.271],	

5.3.106 resp_req

Description:	
This attribute represents the response time required.	
Type:	Element
Format:	Void
Defined values:	
Default value:	
Example:	`<resp_req type="NO_DELAY" />`
Note:	

5.3.106.1 type

Description:		
This attribute represents the response time required		
Type:	Attribute	
Format:	Char String	
Defined values:	NO_DELAY	No delay: The server SHOULD immediately return any location estimate that it currently has.
	LOW_DELAY	Low delay: Fulfilment of the response time requirement takes precedence over fulfilment of the accuracy requirement.
	DELAY_TOL	Delay tolerant: Fulfilment of the accuracy requirement takes precedence over fulfilment of the response time requirement.
Default value:	DELAY_TOL	
Example:	`<resp_req />`	
Note:	The interpretation of these parameters is defined in 3GPP [22.071] and [29.002]. When this parameter is used with the resp_timer, the resp_timer will take precedence over this parameter.	

5.3.107 resp_timer

Description:	
Defines a timer for the response time within which the current location SHOULD be obtained and returned to the LCS Client.	
Type:	Element
Format:	Char String
Defined values:	Maximum number of seconds (must be >= 0)
Default value:	The default value is defined in the location server and will be implementation specific
Example:	`<resp_timer>45</resp_timer>`
Note:	When this parameter is used with the resp_req, this parameter will take precedence over the resp_req.

5.3.108 result

Description:	
A text string indicating the result of the request or an individual positioning	
Type:	Element
Format:	Char string
Defined values:	See section 5.4 "Result codes"
Default value:	
Example:	`<result resid="0">OK</result>`
Note:	

5.3.108.1 resid

Description:	
This attribute represents a numeric representation of a result message	
Type:	Attribute
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	`<result resid="0">OK</result>`
Note:	See section 5.4.

5.3.109 sac

Description:	
Identifies the service area code within a WCDMA network	
Type:	Element
Format:	Char String
Defined values:	0-65535
Default value:	-
Example:	`<sac>548</sac>`
Note:	

5.3.110 semiMajor

Description:	
Specifies the length (in distanceUnit) of the semi-major axis of an ellipse.	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	`<semiMajor>560</semiMajor>`
Note:	

5.3.111 semiMinor

Description:	
Specifies the length (in distanceUnit) of the semi-minor axis of an ellipse.	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	`<semiMinor>560</semiMinor>`
Note:	

5.3.112 Service attributes

5.3.112.1 res_type

Description:		
Defines a response type at the Standard Location and Emergency and Historic Location Immediate Service. This attribute applies to the Standard Immediate Location Request message and the Emergency Immediate Location Request message and Historic Location Immediate Request.		
Type:	Attribute	
Format:	Char string	
Defined values:	SYNC	A LCS Client requests to receive the location response in one response
	ASYNC	A LCS Client allows to receive the location responses in pieces using several consecutive connections initiated by the location Server
Default value:	SYNC	
Example:	`<slir ver="3.5.0" res_type="SYNC">`	
Note:		

5.3.112.2 ver

Description:	
Defines the version of the location protocol. This attribute is valid for ALL messages	
Type:	Element
Format:	Char string
Defined values:	[1-9]+[0-9]*.[0-9]+.[0-9]+
Default value:	
Example:	`<slia ver="3.5.0">`
Note:	

5.3.112.3 cause

Description:		
Defines the reason for sending a Triggered Location Reporting Pause Report message.		
Type:	Attribute	
Format:	Char string	
Defined values:	PAUSE	The reporting is paused
	RESUME	The reporting is resumed
Default value:	N/A	

Example:	`<tlrpr ver="3.5.0" cause="PAUSE">`
	`  <msid>461011678298</msid>`
	`  <req_id>25293</req_id>`
	`</tlrpr>`	

Note:		

5.3.112.4 last

Description:		
Defines if the message is the last Triggered Location Query Report message.		
Type:	Attribute	
Format:	Char string	
Defined values:	YES	This is the final TLQREP
	NO	More TLREP will follow
Default value:	N/A	

Example:	`<tlqrep ver="3.5.0" last="YES">`
	`  <query_id>25267</query_id>`
	`  <trigger_data>`
	`  <req_id>25283</req_id>`
	`  <msid>461011678298</msid>`
	`  </trigger_data>`
	`</tlqrep>`	

Note:		

5.3.112.5 more

Description:		
Defines if a location report is segmented into several Triggered Location Report messages. If more Triggered Location Report messages will follow within a location report it is set to YES. In the last Triggered Location Report messages within a location report it is set to NO.		
Type:	Attribute	
Format:	Char string	
Defined values:	YES	More TLREP will follow within a location report
	NO	This is the final or only TLREP within a location report
Default value:	NO	
Example:	<tlrep ver="3.5.0" more="YES"> <req_id>25267</req_id> <lcs_ref>50</lcs_ref> <trl_pos trl_trigger="PERIODIC"> <msid>461011678298</msid> <pd> <time utc_off="+0300">20020813010423</time> <shape> <CircularArea srsName="www.epsg.org#4326"> <coord> <X>35 35 24.139N</X> <Y>139 35 24.754E</Y> </coord> <radius>15</radius> </CircularArea> </shape> </pd> </trl_pos> <time_remaining>00010000</time_remaining> </tlrep>	
Note:		

5.3.113 serviceid

Description:	
Specifies an id that is used by an entity to identify the service or application that is accessing the network.	
Type:	Element
Format:	Char String
Defined values:	-
Default value:	-
Example:	<serviceid>0005</serviceid>
Note:	

5.3.114 serving_node_privacy_action

Description:	
Indicates the action to be taken by the serving node for LCS Notification Invoke procedure depending on the privacy settings of the target subscriber, i.e., whether the subscriber should be notified or if verification from the subscriber is required. Details related to this parameter is found in [23.271] Rel 6.	
Type:	Element
Format:	Char string
Defined values:	-
Default value:	-
Example:	<serving_node_privacy_action passive_type="POSITION_IF_ALLOWED" active_type="POSITION"/>
Note:	-

5.3.114.1 passive_type

Description:		
The action to be used by the serving node for the LCS Notification Invoke procedure if target subscriber is not originator of location request.		
Type:	Attribute	
Format:	Char string	
Defined values:	POSITION_NOT_ALLOWED	Positioning is not allowed.
	POSITION	Positioning allowed without notifying the UE user
	NOTIFY_AND_POSITION	Positioning allowed with notification to the UE user
	POSITION_IF_NOT_DISALLOWED	Positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user or if there is no response to the notification
	POSITION_IF_ALLOWED	Positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user.
Default value:		
Example:	`<serving_node_privacy_action passive_type="POSITION_IF_ALLOWED"/>`	
Note:	The passive_type is a mandatory attribute. Thus the "POSITION_NOT_ALLOWED" value need to be set when only positioning using an active_type condition is intended to be allowed.	

5.3.114.2 active_type

Description:		
The action to be used by the serving node for the LCS Notification Invoke procedure if target subscriber is originator of location request.		
Type:	Attribute	
Format:	Char string	
Defined values:	POSITION_NOT_ALLOWED	Positioning is not allowed.
	POSITION	Positioning allowed without notifying the UE user
	NOTIFY_AND_POSITION	Positioning allowed with notification to the UE user
	POSITION_IF_NOT_DISALLOWED	Positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user or if there is no response to the notification
	POSITION_IF_ALLOWED	Positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user.
Default value:	POSITION_NOT_ALLOWED	
Example:	`<serving_node_privacy_action passive_type="POSITION_IF_ALLOWED" active_type="POSITION"/>`	
Note:	-	

5.3.115 session

Description:	
This element SHOULD be presented in the location request when the LCS Client has an active session with the User Equipment, this will be either the number called by the UE or the APN on which the UE established the session.	
Type:	Element
Format:	Char String
Defined values:	-
Default value:	-
Example:	`<session type=”DIAL”>447073100177</session>`
Note:	According to [23.271], for a call related location request, the LCS Client includes the LCS Client's called party number, as dialled by the target mobile user, in the LCS service request. For a session related location request, the LCS Client includes the APN-NI of the LCS Client, as used by the target UE, in the LCS service request. It means that it is up to the LCS Client whether the LCS service request is call/session related or not.

5.3.115.1 type

Description:		
Defines the type of session that is established between the User Equipment and LCS Client		
Type:	Attribute	
Format:	Char string	
Defined values:	APN	Access Point Name.
	DIAL	The number dialed by the user to access the LCS client.
Default value:		
Example:	`<session type="DIAL">447073100177</session>`	
Note:		

5.3.116 sessionid

Description:	
Specifies an id that can be used by an entity to support privacy mechanisms, a sessionid may replace the need to use an ID and PWD to use the location services. In a request when a client and sessionid are present together the session id may indicate the number dialed by the end user to access the service or the APN through which the original session was established that initiated the service. The response indicates the sessionid that the entity can use on subsequent requests. In this casethe sessionid could be a generated alphanumeric string and can be time-limited.	
Type:	Element
Format:	Char String
Defined values:	
Default value:	
Example:	`<sessionid>34eg6.876.76h4</sessionid>`
Note:	

5.3.117 sgsn_name

Description:	
Uniquely specifies a SGSN using Diameter identity.	
Type:	Element
Format:	Char String
Defined values:	fqdn
Default value:	
Example:	<sgsn_name>sgsn_name.operatorname.pub.3gppnetwork.org</sgsn_name>
Note:	

5.3.118 sgsnno

Description:	
Uniquely specifies a SGSN within a network.	
Type:	Element
Format:	Char String
Defined values:	In GSM this is the Global Title address. The Global Title is in the same format as an E.164 number.
Default value:	
Example:	<sgsnno>1541154871</sgsnno>
Note:	

5.3.119 speed

Description:	
The speed of the MS in m/s.	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	
Example:	<speed>23</speed>
Note:	This element is present if speed is possible to attain by the used positioning method.

5.3.120 start_time

Description:	
This element defines the absolute start time in a time range.	
Type:	Element
Format:	Char String The time is expressed as yyyyMMddhhmmss where: String / Description yyyy / Year MM / Month dd / Day hh / Hours mm / Minutes ss / Seconds
Defined values:	
Default value:	
Example:	`<start_time>20010630142810</start_time>`
Note:	

5.3.120.1 utc_off

Description:	
Specifies the UTC [UTC] offset in hours and minutes. Positive values indicate time zones east of Greenwich.	
Type:	Attribute
Format:	Char string
Defined values:	[+|-]?0000-1400
Default value:	
Example:	`<start_time utc_off="+0200">20020813010423</start_time>`
Note:	utc_off is specified as 'HHMM', where 'HH' can range between 0-14 and 'MM' between '0-59'. All other values shall result in error 105, 'Format error'.

5.3.121 startAngle

Description:	
The start angle is the angle (in angularUnit) between North and the first defined radius.	
Type:	Element
Format:	Char string
Defined values:	0-359°
Default value:	
Example:	`<startAngle>60</startAngle>`
Note:	

5.3.122 stop_time

Description:	
This element defines the absolute stop time in a time range.	
Type:	Element
Format:	Char String The time is expressed as yyyyMMddhhmmss where: String / Description yyyy / Year MM / Month dd / Day hh / Hours mm / Minutes ss / Seconds
Defined values:	
Default value:	
Example:	`<stop_time>20020630142810</stop_time>`
Note:	

5.3.122.1 utc_off

See section 5.3.120.1

5.3.123 stopAngle

Description:	
The stop angle is the angle (in angularUnit) between the first and second defined radius.	
Type:	Element
Format:	Char string
Defined values:	1-360°
Default value:	
Example:	`<stopAngle>180</stopAngle>`
Note:	

5.3.124 strict

Description:		
Defines if civivloc is requested in location responses.		
Type:	Attribute	
Format:	Char string	
Defined values:	YES	the returned position must only contain what was requested
	NO	the returned position may differ from what was requested
Default value:	NO	
Example:	`<geoinfo strict="YES"></geoinfo>`	
Note:		

5.3.125 subclient

Description:	
Identifies the ASPs, resellers and portals in the chain of service providers between the network and the end-user	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<subclient last_client="NO">`
	`  <id>TheASP</id>`
	`  <serviceid>0006</serviceid>`
	`</subclient>`

Note:	

5.3.125.1 last_client

Description:		
Identifies whether the SUBCLIENT is the last one in the chain or not		
Type:	Attribute	
Format:	Char String	
Defined values:	YES	This is the last client – the one that the end-user is actually communicating with
	NO	This is not the last client
Default value:	NO	
Example:	`<subclient last_client="YES">`	
Note:		

5.3.126 supported_shapes

Description:
Defines the shapes that are supported by the MLS Application. Each supported shape is represented by an attribute as describe in the following sections. Each shape attribute has a decimal value from “0” to “1”. A value of “0” or the absence of a shape attribute indicates that the shape is not supported. All other values are used indicate to the order of preference which the MLS Application has for each shape type. Higher values indicate a higher preference and equal values indicate an equal preference. An additional attribute indicates whether or not Altitude is supported. If supported, it is assumed that it is supported for all shape types and always preferred.
Type: Element
Format: Void
Defined values: -
Default value: -
Example: `<supported_shapes Point="0.1" Polygon="0.5" Altitude="YES" />`
Note: If the supported_shape element is not sent, no information is implied about which shapes the MLS Application supports

5.3.126.1 Point

Description:	
Indicates if the shape Point is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes Point="0.2"/>`
Note:	

5.3.126.2 Linestring

Description:	
Indicates if the shape LineString is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes LineString="0.3"/>`
Note:	

5.3.126.3 Polygon

Description:	
Indicates if the shape Polygon is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes Polygon="0.4"/>`
Note:	

5.3.126.4 Box

Description:	
Indicates if the shape Box is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes Box="0.5"/>`
Note:	

5.3.126.5 CircularArea

Description:	
Indicates if the shape CircularArea is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes CircularArea="0.6"/>`
Note:	

5.3.126.6 CircularArcArea

Description:	
Indicates if the shape CircularArcArea is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes CircularArcArea="0.7"/>`
Note:	

5.3.126.7 EllipticalArea

Description:	
Indicates if the shape EllipticalArea is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes EllipticalArea="0.8"/>`
Note:	

5.3.126.8 MultiLineString

Description:	
Indicates if the shape MultiLineString is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes MultiLineString="0.9"/>`
Note:	

5.3.126.9 MultiPoint

Description:	
Indicates if the shape MultiPoint is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes MultiPoint="0.95"/>`
Note:	

5.3.126.10 MultiPolygon

Description:	
Indicates if the shape MultiPolygon is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"1"
Example:	`<supported_shapes MultiPolygon="0.33"/>`
Note:	

5.3.126.11 LinearRing

Description:	
Indicates if the shape LinearRing is supported and the preference the MLS Application has for this shape relative to others.	
Type:	Attribute
Format:	Char string
Defined values:	
Default value:	"0"
Example:	`<supported_shapes LinearRing="0.335"/>`
Note:	

5.3.126.12 Altitude

Description:	
Indicates if the element Altitude is supported in combination with the supported shapes.	
Type:	Attribute
Format:	Char string
Defined values:	NO
	YES
Default value:	NO
Example:	`<supported_shapes Altitude="YES"/>`
Note:	

5.3.127 ta

Description:	
This Radio Access Network element that can be used to offer enhanced positioning. (Timing Advance)	
Type:	Element
Format:	Char string
Defined values:	0-63
Default value:	0
Example:	`<ta>3</ta>`
Note:	Further Information regarding this element can be found in the relevant GSM Specifications [05.10]

5.3.128 target_area

Description:	
Specify the target area in change_area event. This area may be composed of civic location elements which in turn may be combined with shape elements. If a civic location alone is specified, the Location Server will deduce to the best of its knowledge the area to cover (e.g. by prior provisioning or with a default value). If both a shape and a civic location are specified, both requirements should be met.	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<target_area>`
	`  <name_area>Seoul</name_area>`
	`</target_area>`

Note:	

5.3.129 target_distance

Description:	
Specifes the target distance expressed in meters in distance_event trigger.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<target_distance>30000</target_distance>`
Note:	

5.3.130 target_equidistance

Description:	
Specifes the target equidistance expressed in meters in equidistance event trigger.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<target_equidistance>30000</target_equidistance>`
Note:	

5.3.131 target_serving_node

Description:	
Specifies the target serving node in case of handover.	
Type:	Element
Format:	
Defined values:	
Default value:	
Example:	
Note:	

5.3.132 target_speed

Description:	
Specifes the target speed expressed in m/s in velocity_event trigger.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	

Example:	`<target_speed>`
	`  <speed>30</speed>`
	`</target_speed>`

Note:	

5.3.133 time

Description:		
In a location answer this element indicates the time when the positioning was performed.		
Type:	Element	
Format:	Char String The time is expressed as yyyyMMddhhmmss where:	
	String	Description
	yyyy	Year
	MM	Month
	dd	Day
	hh	Hours
	mm	Minutes
	ss	Seconds
Defined values:		
Default value:		
Example:	`<time>20010630142810</time>`	
Note:		

5.3.133.1 utc_off

See section 5.3.120.1

5.3.134 time_remaining

Description:	
Defines the time remaining until the location server terminates the current triggered location service. The time when the service is valid is either specified by the client using start time and stop time, or is a network operator specific default value where no stop time is defined or where the stop time exceeds the allowed value by the location server involved.	
Type:	Element
Format:	Char String The time is expressed as ddhhmmss where: String: Description dd: Day hh: Hours mm: Minutes ss: Seconds
Defined values:	
Default value:	The default value is defined in the location server
Example:	`<time_remaining>00010000</time_remaining>`
Note:	

5.3.135 trans_id

Description:	
An identifier originally provided by the client so it can associate responses to the original request	
Type:	Element
Format:	Char string
Defined values:	None
Default value:	None
Example:	`<trans_id>uk999call04112417544312</trans_id>`
Note:	trans_id is used to distinguish between multiple location requests of the same target. This implementation is not supported when a range of MSID's are requested by the client

5.3.136 trigger_data

Description:	
Specifies the req_id and one or more msid for and active trigger in triggered location query report	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<trigger_data>`
	`<req_id>25283</req_id>`
	`<msid>461011678298</msid>`
	`<msid>461011678299</msid>`
	`</trigger_data>`

Note:	

5.3.136.1 req_id

See section 1.1.1.

5.3.136.2 msid

See section 5.3.52.

5.3.137 trl_pos

Description:	
Specifies the position of the MS at a triggered location report.	
Type:	Element
Format:	
Defined values:	
Default value:	
Example:	<tlr_pos trl_trigger="PERIODIC"> <msid>4711</msid> <poserr> <result resid="1">SYSTEM FAILURE</result> <time utc_off="0100">20011127104532</time> </poserr> </tlr_pos>
Note:	

5.3.137.1 trl_trigger

Description:		
Specifies the trigger that initiated the positioning of the MS at a triggered location report.		
Type:	Attribute	
Format:	Char string	
Defined values:	PERIODIC	The positioning is triggered when the periodical timer expired
	MS_AVAIL	The positioning is triggered by the MS presence notification
	CHANGE_AREA	The positioning is triggered by the mobility event of the location of MS
	VELOCITY	The positioning is triggered by the velocity event
	DISTANCE	The positioning is triggered by the distance event
	EQUIDISTANCE	The positioning is triggered by the equidistance event
	ALN_EVENT	The positioning is triggered by an ALN event
Default value:		
Example:		
Note:		

5.3.137.2 pos_method

See section 1.1.1.1

5.3.138 url

Description:	
Specifies the location to which a response to a TLRR, an asynchronous SLIR or an asynchronous eme_lir should be sent to	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<url>http://location.client.com/Response/</url>`
Note:	URL is part of pushaddr element which may also contain id and pwd. These elements are used by the LCS Client to inform the Location Server what credentials to use when 'pushing' a location report to the LCS Client in the case of an asynchronous service.

5.3.139 velocity_event

Description:	
Specifies a velocity event in triggered location reporting service	
Type:	Element
Format:	
Defined values:	
Default value:	

Example:	`<velocity_event type="ABOVE" vel_estimates="TRUE">`
	`  <target_speed>`
	`  <speed>30</speed>`
	`  </target_speed>`
	`</velocity_event>`

Note:	

5.3.139.1 type

Description:		
Specifies the trigger criteria that will initiate reporting of the MS		
Type:	Attribute	
Format:	Char string	
Defined values:	INCREASING ABOVE	Reporting performed each time the MS speed increases above the target speed provided the minimum time between reports has elapsed. When the trigger is initiated it is assumed that the MS speed is below the target speed.
	ABOVE	Reporting performed when MS speed is above the target speed provided the minimum time between reports has elapsed.
	DECREASING BELOW	Reporting performed each time the MS speed decreases below the target speed provided the minimum time between reports has elapsed. When the trigger is initiated it is assumed that the MS speed is above the target speed
	BELOW	Reporting performed when MS speed is below the target speed provided the minimum time between reports has elapsed .
Default value:		
Example:		
Note:		

5.3.140 vel_estimates

Description:	
Specifies whether velocity estimates are required or not.	
Type:	Attribute
Format:	Char string
Defined values:	TRUE
	FALSE
Default value:	
Example:	
Note:	Velocity is reported as part of location estimate. Seeting this attribute to TRUE implies that location also will be reported.

5.3.141 vlrno

Description:	
Uniquely specifies a VLR within a network.	
Type:	Element
Format:	Char String
Defined values:	In GSM this is the Global Title address. The Global Title is in the same format as an E.164 number.
Default value:	
Example:	`<vlrno>1541154871</vlrno>`
Note:	

5.3.142 vmscno

Description:	
Uniquely specifies a VMSC within a network.	
Type:	Element
Format:	Char String
Defined values:	In GSM this is the Global Title address. The Global Title is in the same format as an E.164 number.
Default value:	
Example:	<vmscno>1541154871</vmscno>
Note:	

5.3.143 Width

Description:	
This element specifies the requested width of map image	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	0
Example:	<Width>800</Width>
Note:	The default type of map width is defined as pixel.

5.3.144 X

Description:	
The first ordinate in a coordinate system	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	<X>63500</X>
Note:	For the default WGS84 CRS the presentation format is Degrees Minutes Seconds Hemisphere (DMSH), with fields separated by a space character and with leading zeros added to any minute or second values less than 10. Note that in the WGS84 CRS **'X'** denotes the **latitude** of a position. For the default UTM CRS the presentation format is presented in meters. Note that in the UTM CRS **'X'** denotes the **easting** of a position.

5.3.145 Y

Description:	
Second ordinate in a coordinate.system. This is optional if it is a linear coordinate system.	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	<Y>4832438</Y>
Note:	For the default WGS84 CRS the presentation format is Degrees Minutes Seconds Hemisphere (DMSH), with fields separated by a space character and with leading zeros added to any minute or second values less than 10. Note that in the WGS84 CRS **'Y'** denotes the **longitude** of a

	position. For the default UTM CRS the presentation format is presented in meters. Note that in the UTM CRS CRS **'Y'** denotes the **northing** of a position.

5.3.146 Z

Description:	
third ordinate in a coordinate system which has at least three ordinates	
Type:	Element
Format:	Char string
Defined values:	
Default value:	
Example:	`<Z>498</Z>`
Note:	The default Coordinate Reference System WGS84 (#4326 of the EPSG database) uses an "Ellipsoidal 2D Coordinate System". This means for a potential altitude value the parameter 'alt' (cf. 5.3.2 of MLP) is used.

5.3.147 Zone

Description:	
first and the mandatory component in the representation of a location in UTM coordinate system	
Type:	Element
Format:	Char string
Defined values:	1 to 60
Default value:	
Example:	`<Zone>20</Zone>`
Note:	Stands for Zone information of a position in UTM Coordinate System.

5.3.148 Zoom

Description:	
This element specifies the requested zoom level of zoom of map image	
Type:	Element
Format:	Char String
Defined values:	[0-9]+
Default value:	0
Example:	`<Zoom>10.5</Zoom>`
Note:	The default type of Zoom is KILOMETER.

5.3.148.1 ZoomType

Description:	
This element specifies the The zoomtype of Map Requestzoom level	
Type:	Attribute
Format:	Char String
Defined values:	KILOMETER
	METER
	MILE
	INCH
Default value:	KILOMETER
Example:	`<Zoom ZoomType="KILOMETER">1</Zoom>`
Note:	A specific value of element_type may only occur once in a civic location (civicloc)

5.4 Result codes

5.4.1 Result codes

This table defines the result codes that indicate the result of the request or individual positioning. The error codes are divided in ranges:

0	-	99	Location server specific errors
100	-	199	Request specific errors
200	-	299	Network specific errors
300	-	499	Reserved for future use
500	-	599	Vendor specific errors
600	-	699	MLS Client specific errors

Note: For privacy reasons it might be needed to not report certain specific errors. In this case it is up to the implementation or configuration of the location server which errors will be reported.

Resid	Slogan	Description
0	OK	No error occurred while processing the request.
1	SYSTEM FAILURE	The request can not be handled because of a general problem in the location server.
2	UNSPECIFIED ERROR	An unspecified error used in case none of the other errors apply. This can also be used in case privacy issues prevent certain errors from being presented.
3	UNAUTHORIZED APPLICATION	The requesting location-based application is not allowed to access the location server or a wrong password has been supplied.
4	UNKNOWN SUBSCRIBER	Unknown subscriber. The user is unknown, i.e. no such subscription exists.
5	ABSENT SUBSCRIBER	Absent subscriber. The user is currently not reachable.
6	POSITION METHOD FAILURE	Position method failure. The location service fails to obtain the user's position. The exact cause may be indicated in ADD_INFO by the inclusion of an event code (A, B, C etc.) from the list below: A: Target does not support SUPL. B: SUPL Positioning Failure—Target does not support requested service. For example a SUPL 1.0 device doesn't support periodic trigger service. C: SUPL Positioning Failure—Target fails to deliver Cell Info. D: SUPL Positioning Failure—both Cell ID location and GNSS positioning fail.
7	TIMEOUT	Timer expiry for the requested event trigger
101	CONGESTION IN LOCATION SERVER	The request can not be handled due to congestion in the location server.
103	UNSUPPORTED VERSION	The Location server does not support the indicated protocol version.
104	TOO MANY POSITION ITEMS	Too many position items have been specified in the request.
105	FORMAT ERROR	A protocol element in the request has invalid format. The invalid element is indicated in ADD_INFO.
106	SYNTAX ERROR	The position request has invalid syntax. Details may be indicated in ADD_INFO.
107	PROTOCOL ELEMENT NOT	A protocol element specified in the position request is not

	SUPPORTED	supported by the Location Server, or the position result is not supported by the LCS Client. The element is indicated in ADD_INFO.
108	SERVICE NOT SUPPORTED	The requested service is not supported in the Location Server. The service is indicated in ADD_INFO.
109	PROTOCOL ELEMENT ATTRIBUTE NOT SUPPORTED	A protocol element attribute is not supported in the Location Server. The attribute is indicated in ADD_INFO.
110	INVALID PROTOCOL ELEMENT VALUE	A protocol element in the request has an invalid value. The element is indicated in ADD_INFO.
111	INVALID PROTOCOL ELEMENT ATTRIBUTE VALUE	A protocol element attribute in the request has a wrong value. The element is indicated in ADD_INFO.
112	PROTOCOL ELEMENT VALUE NOT SUPPORTED	A specific value of a protocol element is not supported in the Location Server. The element and value are indicated in ADD_INFO.
113	PROTOCOL ELEMENT ATTRIBUTE VALUE NOT SUPPORTED	A specific value of a protocol element attribute is not supported in the Location Server. The attribute and value are indicated in ADD_INFO.
114	CANCELLATION OF TRIGGERED LOCATION REQUEST	The requested triggered location report is cancelled.
115	INVALID MSID IN TLRSR	One or more msid elements in the Triggered Location Reporting Stop Request are not valid to the Location Server.
116	TLRSR FOR INDIVIDUAL TARGET NOT SUPPORTED	The function of stopping triggered location reporting for individual target(s) is not supported in Location Server.
117	NO ANALYTIC DATA AVAILABLE	No analytic data available.
201	QOP NOT ATTAINABLE	The requested QoP cannot be provided. The exact QoP parameter which cannot be provided, i.e. accuracy, response time or max_loc_age, and value are indicated in ADD_INFO.
202	POSITIONING NOT ALLOWED	The subscriber does not allow the application to position him/her for whatever reason (privacy settings in location server, LCS privacy class).
203	CONGESTION IN MOBILE NETWORK	The request can not be handled due to congestion in the mobile network.
204	DISALLOWED BY LOCAL REGULATIONS	The location request is disallowed by local regulatory requirements.
207	MISCONFIGURATION OF LOCATION SERVER	The location server is not completely configured to be able to calculate a position.
208	TARGET MOVED TO NEW MSC/SGSN	The triggered Location Request has been aborted due to that target has moved to another MSC/SGSN. This result code shall only be used towards The Home Location Server. Restrictions: - This code SHALL only be used in RLP. - This result code shall only be used towards The Home Location Server.
500 -599		Vendor specific errors
601	STANDARD LOCATION REPORT SERVICE NOT SUPPORTED	The MLS Client does not support the standard location report service.
602	MLS CLIENT ERROR	An error occurred in the MLS Client.
603	STANDARD LOCATION REPORT SERVICE NOT ACCEPTED	The standard location report was not accepted by the MLS Client.
604	SUBSCRIBER IN STANDARD LOCATION REPORT SERVICE NOT	The subscriber in the Standard Location Report is not valid to the MLS Client.

	VALID	
605	INVALID SERVICE ID IN STANDARD LOCATION REPORT SERVICE	The service identity in the Standard Location Report is not valid to the MLS Client.

5.5 Adaptation to 3GPP LCS (Informative)

5.5.1 Version mapping between 3GPP TS23.271 and this specification

The following table shows the version number of this specification (OMA-TS-MLP-V3_4) fully conforming to a certain version of 3GPP TS23.271, i.e. the version of this specification for the correct reference in a certain version of the 3GPP specification.

3GPP TS23.271 version number	**Conforming version number of** OMA-LOC_MLP_Spec-V3_4
Release 5	Version 3.1
Release 6	Version 3.2
Release 7	Version 3.3
Release 10	Version 3.4

Note: In case there are versions not appearing in this table, it should be interpreted that such update did not affect the other specification. That is, the version number not appearing in the table should apply to the conformance mapping for the closest smaller version number in the table.

5.5.2 The terminology mapping table with 3GPP LCS Specifications

The following is a list of the terms in MLP used differently from the ones defined for 3GPP:

Term		**Notes**
MLP	**3GPP**	
Location Server	LCS Server	
MS (Mobile Station)	UE	
MSID (Mobile Station Identifier)	Identification of the target UE	
MPC (Mobile Positioning Centre)		There is no term applicable to 3GPP.

5.5.3 The corresponding terms used for the location procedures in 3GPP LCS Definition

The following is a list of terms defined in MLP corresponding to the 3GPP LCS definition [23.271] for the location procedures.

Location procedures defined in 3GPP[23.271]		**Services defined in MLP**
Circuit Switched Mobile Terminating Location Request CS-MT-LR	LCS Service Request	Standard Location Immediate Request
	LCS Service Response	Standard Location Immediate Answer
CS-MT-LR without HLR Query - applicable to North America Emergency Calls only	LCS Service Request	Emergency Location Immediate Request
	LCS Service Response	Emergency Location Immediate Answer
Packet Switched Mobile Terminating Location Request PS-MT-LR	LCS Service Request	Standard Location Immediate Request
	LCS Service Response	Standard Location Immediate Answer
Network Induced Location Request NI-LR	Location Information	Emergency Location Report

Location procedures defined in 3GPP[23.271]		Services defined in MLP
Packet Switched Network Induced Location Request PS-NI-LR	Location Information	Emergency Location Report
Mobile Terminating Deferred Location Request	LCS Service Request	Triggered Location Reporting Request
	LCS Service Response(Provide Subscriber Location ack)	Triggered Location Reporting Answer
	LCS Service Response(Subscriber Location Report)	Triggered Location Report
Combined Periodical/Deferred Mobile Terminating Location Request	LCS Service Request	Triggered Location Reporting Request
	LCS Service Response(Provide Subscriber Location ack)	Triggered Location Reporting Answer
	LCS Service Response(Subscriber Location Report)	Triggered Location Report
Cancellation of a Deferred Location Request	LCS Cancel Service Request	Triggered Location Reporting Stop Request
	LCS Cancel Service Response	Triggered Location Reporting Stop Answer
Mobile Originating Location Request, Circuit Switched CS-MO-LR	Location Information	Standard Location Report
	Location Information Ack	Standard Location Report Answer
Mobile Originating Location Request, Packet Switched PS-MO-LR	Location Information	Standard Location Report
	Location Information Ack	Standard Location Report Answer

5.5.4 Error Mapping (Informative)

The following list provides a mapping between the errors defined for LCS in MAP (see [29.002]) and MLP (see section 5.4)

MAP error	MLP resid
Unknown subscriber	4
Unidentified Subscriber	4
Absent Subscriber	5
System failure	1
Facility Not Supported	6
Unexpected Data Value	1
Data missing	1
Unauthorised LCS Client with detailed reason	3
Position method failure with detailed reason.	6
Illegal Subscriber	2
Illegal Equipment	2
Unauthorized requesting network	2

5.6 HTTP Mapping

This section describes how to use MLP over the HTTP transport mechanism using "HTTP/1.1".

HTTP is a request/response protocol involving a server and a client. In the context of MLP, the client is referred to as the LCS Client and the server is the Location Server (GMLC/MPC). For more information about HTTP, refer to [RFC2616] and http://www.w3.org

The Location Server MAY provide two socket ports for operation, one for encryption with SSL/TLS and one without. The reason for having one insecure port is that encryption can consume resources, and if the client is in a secure domain there might not be a need for encryption. Applications residing in an insecure domain, i.e. on the Internet, may use the secure port to ensure the security and privacy of the location information.

For further information about SSL/TLS see [RFC2246].

Four port numbers have been selected and proposed as standard ports for location servers implementing MLP. These ports are registered with IANA (Internet Assigned Numbers Authority, see [IANA]). The four port numbers are:

lif-mlp	9210/tcp	LIF Mobile Locn Protocol
lif-mlp	9210/udp	LIF Mobile Locn Protocol
lif-mlp-s	9211/tcp	LIF Mobile Locn Secure
lif-mlp-s	9211/udp	LIF Mobile Locn Secure

A Location Server MAY choose to introduce any other socket based or HTTP transparent technology for secure transfers. Any such technology SHALL be provided over a different port than the four mentioned above.

5.6.1 Location Services using HTTP

An LCS Client SHALL request a Location Service by issuing an HTTP POST request towards the Location Server. For more information about HTTP POST, see [RFC2616]. The request line syntax is shown below.

```
Request-line =          POST SP path SP HTTP/1.1 CRLF
```

The request MUST include the entity-header Content-length field as part of the request. The message body of the request SHALL include the XML formatted request and SHALL have the length specified by the LCS Client in the Content-length field.

If the request is a triggered request the result SHALL be delivered to the LCS client through an HTTP POST operation issued by the Location Server. This implies that the LCS client MUST be able to receive HTTP POST requests and give a valid response.

All Location Services are invoked by sending a request using HTTP POST to a certain URI. An example of an URI is shown below.

```
http:// location-server.example.com:9210/LocationQueryService/
```

The response to the invocation of a Location Service SHALL be returned using an HTTP response.

If the LCS client requests standard location of asynchronous mode, triggered reporting of location, the Location Server SHALL return the report by performing an HTTP POST operation towards the client. The client must specify the URI that the answer should be posted to. This is done in the service request or by having it in the LCS client profile that can be stored in the Location Server.

The report SHALL be included in the message body and the Content-length entity SHALL be set to the length of the answer.

When an LCS client attempts to invoke a service request that is not defined in this specification, the Location Server SHALL return a General Error Message (GEM) in a HTTP '404' error reponse:

```
Status-Line=            HTTP/1.1 SP 404 SP Not Found CRLF
```

5.6.2 Request and Response Encapsulation

A request SHALL have a header part and a body part. A response MAY have a header part and SHALL have a body part. To be able to make a location request with a single XML document the header and the body are encapsulated in the same service initiation DTD. The context header holds the authentication and authorization data pertinent to a particular location request. The body part is described in the sections 5.2.3.2- 5.2.3.6.

5.6.2.1 Service Initiation DTD

```
<!-- MLP_SVC_INIT -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_init PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_init>
      ...
   </svc_init>

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http://www.openmobilealliance.org/
-->

<!ENTITY    % extension.message       "">

<!ELEMENT   svc_init                 (hdr, (slir | eme_lir | tlrr | tlrsr | hlir | tlrqr
                                     %extension.message;))>
<!ATTLIST   svc_init
            ver CDATA                #FIXED "3.5.0">

<!ENTITY    %                        SYSTEM "MLP_ID_QOP_RES_SHAPE_3_5.DTD">
            mlp_id_qop_res_shape.dtd
%mlp_id_qop_res_shape.dtd;
```

Example

```
<?xml version="1.0" ?>
<!DOCTYPE svc_init SYSTEM " MLP_v3_5.dtd">
<svc_init ver="3.5.0">
  <hdr ver="3.5.0">
    ...
  </hdr>
  <slir ver="3.5.0">
    ...
  </slir>
</svc_init>
```

5.6.2.2 Service Result DTD

```
<!-- MLP_SVC_RESULT -->
<!--
MLP V3.5 Document Type Definition

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MLP is an XML language. Typical usage:
   <?xml version="1.0"?>
   <!DOCTYPE svc_result PUBLIC "-//OMA//DTD {abbrev x.y}//EN"
             "http://www.openmobilealliance.org/DTD/{filename}"
             [<?oma-{ref}-ver supported-versions="{versions}"?>]>
   <svc_result>
      ...
   </svc_result}>

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Open Mobile Alliance Ltd. web site at
http://www.openmobilealliance.org/
-->

<!ENTITY    % extension.message        "">
<!ELEMENT   svc_result                (hdr?, (slia | slirep | slrep | slra | eme_lia | emerep |
                                      eme_lirep | tlra | tlrep | tlrsa | hlia | hlirep | tlrpr|
                                      tlrqa | tlqrep  %extension.message;))>

<!ATTLIST   svc_result
            ver CDATA                 #FIXED "3.5.0">
```

Example

```
<?xml version="1.0" ?>
<!DOCTYPE svc_result SYSTEM "MLP_v3_5.dtd">
<svc_result ver="3.5.0">
  <slia ver="3.5.0">
    ...
  </slia>
</svc_result>
```

5.6.2.3 Message Sequence Diagram

The following HTTP sequence (cf. Figure 9) is used for all the defined service requests/responses in MLP.

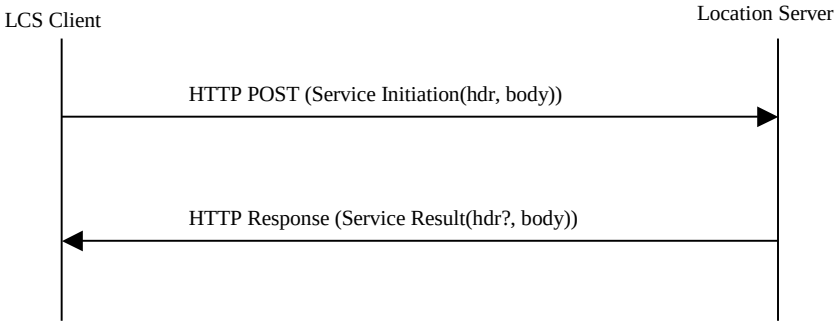

Figure 9: HTTP sequence for MLP request/response pairs

The following HTTP sequence diagram (cf. Figure 10) is used for all defined reports in MLP except for Standard Location Report.

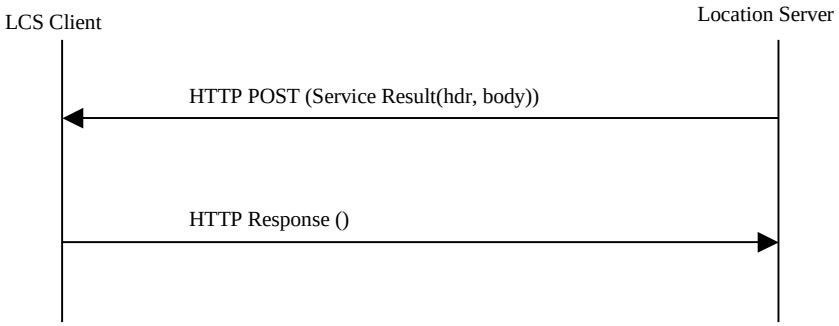

Figure 10: HTTP sequence for MLP reports

The following HTTP sequence diagram (cf. Figure 11) is used for the report and answer in Standard Location Reporting Service.

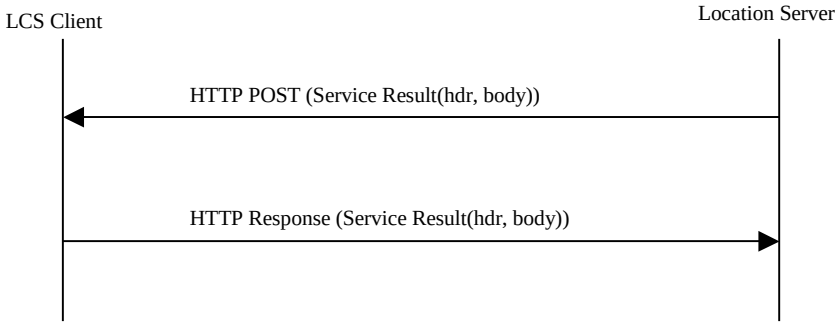

Figure 11: HTTP sequence for MLP Standard Location Reporting Service.

The following HTTP sequence diagram (cf. Figure 12) is used in the case of a General Error Message.

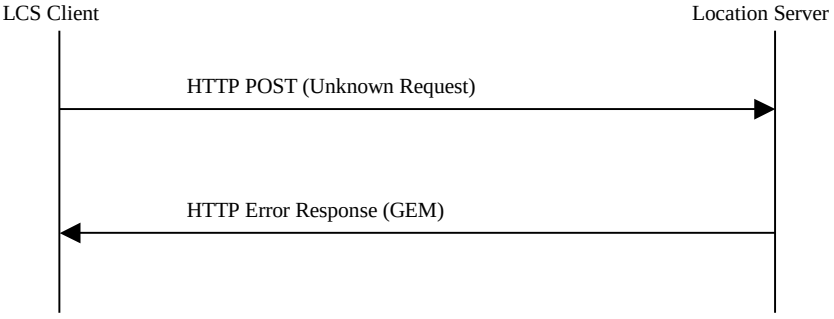

Figure 12: HTTP sequence for the General Error Message

5.7 Geographic Information

5.7.1 Coordinate Reference systems (Informative)

The study of determining the relative positions on or close to the surface of the earth is a complex science, referred to as geodesy. A complete definition of Coordinate Reference systems is not within the scope of this standard. This section

includes a brief overview of the subject. For more details see the OpenGIS© Consortium Abstract Specification Topic 2 [AST].

5.7.1.1 The Geoid, ellipsoids and datums

The Geoid is a physically realizable surface defined by the set of points with equal gravity potential approximately at the Mean Sea Level. While this surface is measurable it is not easy to define mathematically. In order to use known mathematics, the Geoid is approximated by an ellipsoid (spheroid).

There are many ellipsoids, each defined to best approximate some part of the Geoid. These ellipsoids are defined by an ellipse that is rotated about the major axis. There are many methods for defining an ellipse, the most common used in Geodesy the length of the semi-major axis and the flattening. This defines a mathematical ellipsoid for calculations. it does not provide enough information to locate the ellipsoid with respect to the Geoid or other ellipsoids. To locate the ellipsoid in space a datum is defined. Some of the common ellipsoids are WGS84, Bessel1841, Clark 1866.

A datum is the ellipsoid with it's position in space. The position is defined by the origin and orientation of the ellipsoid with respect to the Geoid. Different datums locate latitude, longitude at different positions in space. For example ellipsoids Samboja, CH1903 and Stockholm are each based on Bessel1841, the National Geodetic Network and World Geodetic System 1984 are based on WGS84.

5.7.1.2 Coordinate systems

A coordinate system is the link between the datum and the coordinate values. It defines all of the information about the axes system that defines the values. The names of the axes, their units (formats), the order of ordinates ((Easting, Northing) versus (Northing, Easting)) and the angle between the axes are defined by the coordinate system.

5.7.1.2.1 Cartesian coordinate systems

A Cartesian coordinate system is defined by values of (x,y,(z)). x is the distance from the x-axis, y is the distance from the y-axis, z the distance from the z-axis.The axis are orthogonal to each other. The unit used for x, y, z are a distance unit, such as meter. These coordinate systems are used for flat 'planar' descriptions of points. In general they are used over small areas where a projection method has been used to minimize distortions of the geography in the area.

5.7.1.2.2 Ellipsoid coordinates

More global geographic calculations need to take the surface of the earth into account. So we need a second coordinate system that describes each position relative to other points and lines on the earth’s surface.

Each point can then be described as set of values (longitude, latitude) or (longitude, latitude, altitude) giving a point on the ellipsoid or relative to the ellipsoid we choose to describe the earth (cf. Figure 13). The longitude tells us how far east we have to move on the equator from the null-meridian, the latitude tells us how far north to move from the equator and the altitude tells us how far above the ellipsoid to go to finally reach the location. Negative values direct us to go in the opposite direction.

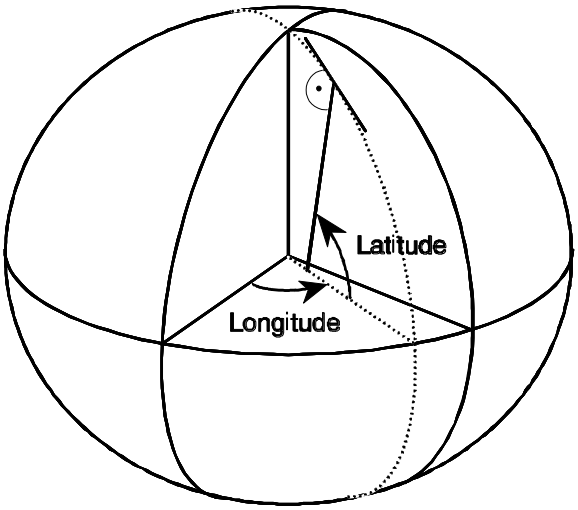

Figure 13: Ellipsoid Coordinates

5.7.1.3 Coordinate Reference Systems

The two coordinate reference systems relevant to this protocol are Geographic 2D Coordinate Reference Systems and Projected Coordinate Reference Systems.

Geographic 2D Coordinate Reference Systems describe locations on the ellipsoid. They are used for large national or continental geodetic networks. In particular GPS uses the Geographic 2D Coordinate Reference System WGS84. This uses the World Geodetic System 1984 based on the WGS84 ellipsoid. The coordinate axes have units of decimal degrees (or DMSH) with ordinate order (Northing, Easting). This Coordinate Reference System is the default for all basic MLP service requests and responses. A GMLC is only required to support WGS84. The GMLC geographies that are defined with altitude are modeled in this protocol as geographies in a Geographic 2D CRS with a separate altitude element, not as a Geographic 3D CRS. The geographies are planar and carrying a constant z value is not desirable.

There are several ways to convert ellipsoid coordinates to 2 dimensional cartesian coordinates. These are called projection methods. Each method is designed to minimize some type of distortion in the mapping for the ellipsoid to the 2D Cartesian coordinate system.

Projected Coordinate Reference Systems are used for map display, to allow Cartesian mathematics and for Advanced Location Services.

5.7.2 Coordinate Reference System Transformations (Informative)

A transformation is used to define a point in one CRS into the appropriate values in a second CRS. When the datums are the same, the transformation can frequently be defined by equations. A transformation from one datum to another is usually done with a least squares approximation. Transformation equations are available in from several places, transformation services are also available.

5.7.3 Methodology for defining CRSs and transformations in this protocol (Informative)

The MLP protocol defines the CRS by citing an authority and the unique reference identifier for the CRS defined by this authority. This leaves the definition of many CRS used over the world to be defined by a group of geodesy experts. This methodology is used by the OpenGIS© Consortium and the ISO TC 211 working group for well-known CRS. The encoding used is from the OpenGIS© Consortium Recommendation Paper 01-014r5: Recommended Definition Data for Coordinate Reference Systems and Coordinate Transformations [CRS].

The MLP protocol may use the {EPSG} authority as an example. Support of other authority is for further study. This database is defined by a Microsoft Access database which can be found at www.epsg.org. An xml version of this database will be available at http://www.opengis.net/gml/srs/epsg.xml in the future.

The default WGS84 CRS is defined to be 4326 by the EPSG authority. Other examples are 326xx define the UTM xx N zones.

EPSG recommends that real numbers are used for internal data processing but that for interfacing with human beings the preferred representation be degree, minute, second, hemisphere (DMSH). For geographic coordinate reference systems with coordinate systems in degrees.

Where the value is held in several fields, as for example in DMSH representation, various symbols, words or character strings are in use as field identifiers and separators. For DMSH representation EPSG recommends that the degree, minute and second units are indicated through the suffixed symbols ° ' " (ASCII character codes 186, 39 and 34) respectively, for example 35°45'09.18"N, 65°45'09.18"W. Spaces are excluded from the separator and for minute and second values under 10 leading zeroes are included.

5.7.4 Supported coordinate systems and datum (Normative)

All MLP implementations MUST support at least the WGS84 Coordinate Reference System.

5.7.5 Shapes representing a geographical position (Informative)

There are a number of shapes used to represent a geographic area that describes where a mobile subscriber is located. There are additional shapes that are required for advanced MLP services. The standards bodies for geographic data for advanced MLP services such as routing, geocoding, coordinate conversion, and map display are the Location Interoperability Forum, the OpenGIS© Consortium and the ISO TC211 working group. The current public XML specification defining geography from these groups is GML V211 [GML]. These two groups work together and are working towards a GML V3 with additional geometry and topology types. The geometry required for the MLP is the GMLV211 with additional polygon types with boundaries that contain circles, ellipses or circular arcs. GML V3 will define the linear curves segments to allow these polygons to be defined. These boundaries will be defined as special cases of polygons, using the given interpolation methods. The following geographies are defined in this protocol. The relevant OGC Abstract Specification is Topic 1 [GEO].

5.7.5.1 Ellipsoid point

This a point on the ellipsoid and is modeled as a point in a Geographic 2D Coordinate Reference Systems.

5.7.5.2 Ellipsoid point with uncertainty circle

An ellipsoid point with uncertainty circle is characterized by the coordinates of an ellipsoid point (the origin) and a radius, “r” (cf. Figure 14). It describes the set of points on the ellipsoid, which are at a distance from the point of origin less than or equal to “r”. This shape can be used to indicate points on the Earth surface, or near the Earth surface. This shape is a special case of a polygon with no interior boundaries.

The typical use of this shape is to indicate a point when its position is known only with a limited accuracy.

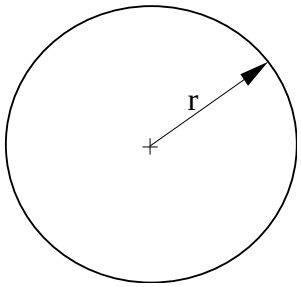

Figure 14: Ellipsoid point with uncertainty circle

5.7.5.3 Ellipsoid point with uncertainty ellipse

The shape of an "ellipsoid point with uncertainty ellipse" is characterized by the following (cf. Figure 15):

- The coordinates of an ellipsoid point (the origin)
- The distances r1 and r2
- The angle of orientation A

It describes formally the set of points on the ellipsoid, which fall within or on the boundary of an ellipse. This ellipse has a semi-major axis of length r1 oriented at angle A (0 to 180°) measured clockwise from north and a semi-minor axis of length r2. The distances being the geodesic distance over the ellipsoid, i.e., the minimum length of a path staying on the ellipsoid and joining the two points, as shown in figure below.

As for the ellipsoid point, this can be used to indicate points on the Earth's surface, or near the Earth's surface, of same latitude and longitude. This shape is a special case of a polygon with no interior boundaries.

The typical use of this shape is to indicate a point when its position is known only with a limited accuracy, but the geometrical contributions to uncertainty can be quantified.

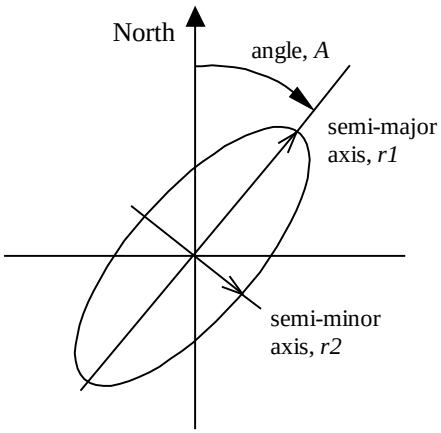

Figure 15: Ellipsoid point with uncertainty ellipse

5.7.5.4 Ellipsoid point with uncertainty arc

The shape of an "ellipsoid point with uncertainty arc" is characterized by the following (cf. Figure 16):

- The coordinates of an ellipsoid point (the origin)
- The inner radius(r_1) and uncertainty radius(r_2),
- The offset angle (θ) and included angle (β)

An arc is defined by a point of origin with one offset angle and one uncertainty angle plus one inner radius and one uncertainty radius. In this case the striped area describes the actual arc area. The smaller arc defines the inner radius(r_1) and the difference between inner and the outer arc defines the uncertainty radius(r_2). This shape is a special case of a polygon with no interior boundaries.

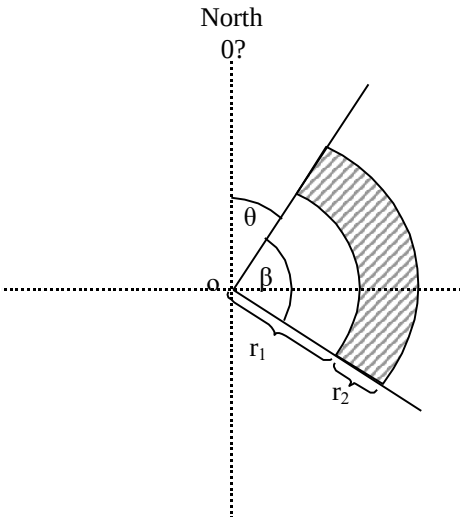

Figure 16: Ellipsoid point with uncertainty arc

5.7.5.5 Polygon

A Polygon is a connected surface. Any pair of points in the polygon can be connected to one another by a path. The boundary of the Polygon is a set of LinearRings. We distinguish the outer (exterior) boundary and the inner (interior) boundaries; the LinearRings of the interior boundary cannot cross one another and cannot be contained within one another. There must be at most one exterior boundary and zero or more interior boundary elements. The ordering of LinearRings and whether they form clockwise or anti-clockwise paths is not important. The minimum number of points allowed in a LinearRing is 3.

A LinearRing is a closed, simple piece-wise linear path which is defined by a list of coordinates that are assumed to be connected by straight line segments. The last coordinate must be coincident with the first coordinate and at least four coordinates are required (the three to define a ring plus the fourth duplicated one) except for the case where this geometry is used in the construction of a Polygon the last coordinate may, to conform to [23.032], be different to the first coordinate, in which case the last coordinate will be connected to the first coordinate by a straight line segment.

For basic MLP services polygons are the number of interior bondaries MUST be 0. Also to conform to [23.032] the maximum number of points allowed in an exterior boundary is 15. The points shall be connected in the order that they are given.

The described area is situated to the right of the exterior boundaries and left of the interior boundaries with the downward direction being toward the Earth's center and the forward direction being from a point to the next.

Note: This definition does not permit connecting lines greater than roughly 20 000 km. If such a need arises, the polygon can be described by adding an intermediate point.

Computation of geodesic lines is not simple. Approximations leading to a maximum distance between the computed line and the geodesic line of less than 3 meters are acceptable.

5.7.5.6 LineString

A LineString is a piece-wise linear path defined by a list of coordinates that are assumed to be connected by straight line segments. A closed path is indicated by having coincident first and last coordinates. At least two coordinates are required.

5.7.5.7 Box

The Box element is used to encode extents. Each <Box> element encloses a sequence of two <coord> elements containing exactly two coordinate tuples; the first of these is constructed from the minimum values measured along all axes, and the second is constructed from the maximum values measured along all axes

5.7.5.8 Geometries Collections

These are geometry objects that contain 2 or more primitive geometry objects. These collections can either be homogenous, a set of points, or heterogeneous, a point, circularArea and a LineString.

Geometry collections are not valid for the basic MLP services.

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-TS-MLP-V3_2-20110719-A	19 Jul 2011	Initial Approved version
OMA-TS-MLP-V3_3-20110719-A	19 Jul 2011	Initial Approved version

A.2 Draft/Candidate Version 3.5 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-TS-MLP-V3_5	19 Aug 2013	n/a	Initial draft based on OMA-TS-MLP-V3_4-20130226-C with alignment to latest template. Version number updated from 3.4 to 3.5 where applicable.
	27 Sep 2013	5.2.2.1, 5.3.59, 5.3.58	Implemented CR: OMA-LOC-2013-0118-CR_MLP3.5_TS_unspecified_target_devices Corrected header A.2
	27 Nov 2013	4.6, 5.2.2.1, 5.2.2.2, 5.2.2.3, 5.2.2.5, 5.2.2.8, 5.2.3.1.1, 5.2.3.2.1, 5.2.3.3.1, 5.2.3.6.1, 5.3, B.1, B.2	Implemented CRs: OMA-LOC-2013-0117R03- CR_MLS1.4_TS_MLP3.5_Supported_Shapes OMA-LOC-2013-0165-CR_MLP_3_5_IntroductionUpdate OMA-LOC-2013-0166R01-CR_ESRD_ESRK OMA-LOC-2013-0167- CR_MLP3.5_TS_venue_specific_device_names OMA-LOC-2013-0169R01- CR_MLP3.5_TS_high_precision_and_relative_location OMA-LOC-2013-0170R01- CR_MLP3.5_TS_access_location_network_events
	27 Feb 2014	2.2, 3.2, 3.3, 5.2.2.1, 5.2.2.2, 5.2.2.3, 5.2.3.6, 5.3	Implemented CRs: OMA-LOC-2013-0168R02- CR_MLP3.5_TS_venue_specific_civic_location OMA-LOC-2014-0013-CR_MLP3.5_TS_group_trigger_conditions OMA-LOC-2014-0014- CR_MLP3.5_TS_persistence_of_trigger_conditions OMA-LOC-2014-0026-CR_MLS_1_4_MLP_XML_Errors OMA-LOC-2014-0027R01-CR_MLS_1_4_MLP_35_LocationURI OMA-LOC-2014-0028-CR_MLS_1_4_MLP_35_LocationIdentifier
	09 Jun 2014	5.2.2.2, 5.2.2.3, 5.2.2.8, 5.2.3.1, 5.2.3.6, 5.2.3.6.1, 5.3, 5.4.1, B	Implemented CRs: OMA-LOC-2014-0085R02-CR_MLP3.5_TS_analytic_events OMA-LOC-2014-0087- CR_MLS_1_4_MLP_35_Correction_LocationIdentifier OMA-LOC-2014-0089- CR_MLS_1_4_MLP_35_Correction_Requestmode OMA-LOC-2014-0090- CR_MLS_1_4_MLP_35_RequestForLocationURIandIdentifier OMA-LOC-2014-0091R01-CR_MLS_1_4_MLP_35_PrivacyActions OMA-LOC-2014-0117R01-CR_MLP3.5_Diameter_Realm
	02 Sep 2014		Implemented CRs: OMA-LOC-2014-0143- CR_MLS_1_4_MLP_35__correction_DTD_Examples OMA-LOC-2014-0160- CR_MLP3.5_TS_venue_specific_device_names_corrections
	03 Sep 2014	5.3.122	Implemented CRs: OMA-LOC-2014-0132-CR_MLP3.5_Supported_shapes_correction
	06 Nov 2014	multiple	Implemented CRs: OMA-LOC-2014-0166R01-CR_MLS_1_4_MLP_CONR_Resolutions OMA-LOC-2014-0167R01- CR_MLS_1_4_MLP_CONR_Resolution_ReferencePoint Applied editorial corrections per CONRR

Document Identifier	Date	Sections	Description
	23 Jan 2015	5.2.2.2, 5.2.2.3, 5.2.2.5	Implemented CRs: OMA-LOC-2014-0191R01- CR_MLS_1_4_MLP_XML_Validate_Resolutions
Candidate Version OMA-TS-MLP-V3_5	24 Feb 2015	n/a	Status changed to Candidate by TP TP Ref # OMA-TP-2015-0061- INP_MLS_V1_4_ERP_and_ETR_for_Candidate_Approval
Draft Versions OMA-TS-MLP-V3_5	10 Jun 2015	2.1, 5.2.2.3, 5.3.19	Incorporated CR: OMA-LOC-2015-0026-CR_MLP_35__adding_missing_civic_types Editorial changes
	16 Nov 2015	5.2.2.3, 5.3.58	Incorporated CR: OMA-LOC-2015-0050R01- CR_MLP_35_Adding_BarometricPressure
	26 Jan 2016	2.1, 3.3, 5.2.2.3, 5.3.34.1, 5.3.92	Incorporated CRs: OMA-LOC-2016-0002- CR_MLP_3.5_additional_indoor_positioning_methods OMA-LOC-2016-0003R03- CR_MLP_3.5_updates_for_hybrid_positioning Editorial changes
Draft Versions OMA-TS-MLP-V3_5	19 Nov 2018	2, 5	OMA-LOC-2018-0004R01-CR_MLP_3.5_5G_Location
Candidate Version OMA-TS-MLP-V3_5	11 Dec 2018	n/a	Status changed to Candidate by LOC OMA-LOC-2018-0021 INP_MLS_Evolution_v1.4_ERP_for_Candidate_reapproval_notification

Appendix B. Static Conformance Requirements (Normative)

The notation used in this appendix is specified in [SCRRULES].

B.1 SCR for Client

B.1.1 Service Initiation DTD

Item	Function	Reference	Status	Requirement
MLP-A-C-001	Service Initiation	5.6.2.1	M	MLP-A-C-002 AND MLP-A-C-003
MLP-A-C-002	Header	5.6.2.1	M	
MLP-A-C-003	Standard Location Immediate Request	5.6.2.1	O	MLP-B-C-003 AND MLP-B-C-004
MLP-A-C-004	Emergency Location Immediate Request	5.6.2.1	O	MLP-B-C-007
MLP-A-C-005	Triggered Location Reporting Request	5.6.2.1	O	MLP-B-C-010 AND MLP-B-C-011 AND MLP-B-C-012
MLP-A-C-006	Triggered Location Reporting Stop Request	5.6.2.1	O	MLP-B-C-012
MLP-A-C-009	Triggered Location Reporting Query Request	5.6.2.1	O	MLP-B-C-017
MLP-A-C-008	Historic Location Immediate Request	5.6.2.1	O	MLP-B-C-014
MLP-A-C-007	Extension Message	5.6.2.1	O	

B.1.2 Service Result DTD

Item	Function	Reference	Status	Requirement
MLP-B-C-001	Service Result	1.1.1.1	M	MLP-B-C-002 AND MLP-B-C-003
MLP-B-C-002	Header	1.1.1.1	O	
MLP-B-C-003	Standard Location Immediate Answer	1.1.1.1	O	
MLP-B-C-004	Standard Location Immediate Report	1.1.1.1	O	
MLP-B-C-005	Standard Location Report	1.1.1.1	O	
MLP-B-C-006	Standard Location Report Answer	1.1.1.1	O	
MLP-B-C-007	Emergency Location Immediate Answer	1.1.1.1	O	
MLP-B-C-008	Emergency Location Immediate Report	1.1.1.1	O	MLP-B-C-007
MLP-B-C-009	Emergency Location Report	1.1.1.1	O	
MLP-B-C-010	Triggered Location Reporting Answer	1.1.1.1	O	MLP-B-C-011
MLP-B-C-011	Triggered Location Report	1.1.1.1	O	MLP-B-C-010
MLP-B-C-012	Triggered Location Reporting Stop Answer	1.1.1.1	O	

Item	Function	Reference	Status	Requirement
MLP-B-C-016	Triggered Location Reporting Pause Report	1.1.1.1	O	
MLP-B-C-017	Triggered Location Reporting Query Answer	1.1.1.1	O	
MLP-B-C-018	Triggered Location Query Report	1.1.1.1	O	
MLP-B-C-014	Historic Location Immediate Answer	1.1.1.1	O	
MLP-B-C-015	Historic Location Immediate Report	1.1.1.1	O	
MLP-B-C-013	Extension Message	1.1.1.1	O	

B.1.3 Header

Item	Function	Reference	Status	Requirement
MLP-C-C-001	client	5.2.3.1	M	
MLP-C-C-002	sessionid	5.2.3.1	O	
MLP-C-C-003	subclient	5.2.3.1	O	
MLP-C-C-004	requestor	5.2.3.1	O	
MLP-C-C-005	supported_shapes	5.2.3.1	O	
MLP-C-C-006	serving_node_privacy_action	5.2.3.1	O	

B.1.4 Standard Location Immediate Request

Item	Function	Reference	Status	Requirement
MLP-D-C-001	msids	1.1.1.1.1	O	
MLP-D-C-002	msid	1.1.1.1.1	M	
MLP-D-C-003	codeword	1.1.1.1.1	O	
MLP-D-C-004	gsm_net_param	1.1.1.1.1	O	
MLP-D-C-005	trans_id	1.1.1.1.1	O	
MLP-D-C-006	eqop	1.1.1.1.1	O	
MLP-D-C-007	geo_info	1.1.1.1.1	O	
MLP-D-C-008	loc_type	1.1.1.1.1	O	
MLP-D-C-009	prio	1.1.1.1.1	O	
MLP-D-C-010	pushaddr	1.1.1.1.1	O	
MLP-D-C-011	service_coverage	1.1.1.1.1	O	
MLP-D-C-013	MapRequest	1.1.1.1.1	O	
MLP-D-C-014	MotionStateRequest	1.1.1.1.1	O	
MLP-D-C-015	ReferencePoint	1.1.1.1.1	O	
MLP-D-C-012	extension parameter	1.1.1.1.1	O	

B.1.5 Standard Location Immediate Answer

Item	Function	Reference	Status	Requirement
MLP-E-C-001	pos	5.2.3.2.2	M	
MLP-E-C-002	req_id	5.2.3.2.2	O	
MLP-E-C-003	result	5.2.3.2.2	M	
MLP-E-C-004	add_info	5.2.3.2.2	O	
MLP-E-C-005	extension parameter	5.2.3.2.2	O	

B.1.6 Standard Location Immediate Report

Item	Function	Reference	Status	Requirement
MLP-F-C-001	req_id	5.2.3.2.3	M	MLP-E-C-002
MLP-F-C-002	pos	5.2.3.2.3	M	
MLP-F-C-003	extension parameter	5.2.3.2.3	O	

B.1.7 Emergency Location Immediate Request

Item	Function	Reference	Status	Requirement
MLP-G-C-001	msids	5.2.3.3.1	O	
MLP-G-C-002	msid	5.2.3.3.1	M	
MLP-G-C-003	gsm_net_param	5.2.3.3.1	O	
MLP-G-C-004	trans_id	5.2.3.3.1	O	
MLP-G-C-005	esrd	5.2.3.3.1	O	
MLP-G-C-006	esrk	5.2.3.3.1	O	
MLP-G-C-007	eqop	5.2.3.3.1	O	
MLP-G-C-008	geo_info	5.2.3.3.1	O	
MLP-G-C-009	loc_type	5.2.3.3.1	O	
MLP-G-C-010	pushaddr	5.2.3.3.1	O	
MLP-G-C-012	supl_support_params	5.2.3.3.1	O	
MLP-G-C-013	MapRequest	5.2.3.3.1	O	
MLP-G-C-014	ReferencePoint	5.2.3.3.1	O	
MLP-G-C-011	extension parameter	5.2.3.3.1	O	

B.1.8 Emergency Location Immediate Answer

Item	Function	Reference	Status	Requirement
MLP-H-C-001	eme_pos	5.2.3.3.2	M	
MLP-H-C-002	req_id	5.2.3.3.2	O	
MLP-H-C-003	result	5.2.3.3.2	M	
MLP-H-C-004	add_info	5.2.3.3.2	O	
MLP-H-C-005	extension parameter	5.2.3.3.2	O	

B.1.9 Emergency Location Immediate Report

Item	Function	Reference	Status	Requirement
MLP-I-C-001	req_id	5.2.3.3.3	M	MLP-H-C-002
MLP-I-C-002	eme_pos	5.2.3.3.3	M	
MLP-I-C-003	result	5.2.3.3.3	M	
MLP-I-C-004	add_info	5.2.3.3.3	O	
MLP-I-C-005	extension parameter	5.2.3.3.3	O	

B.1.10 Standard Location Report

Item	Function	Reference	Status	Requirement
MLP-J-C-001	pos	5.2.3.4.1	M	
MLP-J-C-002	extension parameter	5.2.3.4.1	O	

B.1.11 Standard Location Report Answer

Item	Function	Reference	Status	Requirement
MLP-K-C-001	result	5.2.3.4.2	M	
MLP-K-C-002	add_info	5.2.3.4.2	O	
MLP-K-C-003	extension parameter	5.2.3.4.2	O	

B.1.12 Emergency Location Report

Item	Function	Reference	Status	Requirement
MLP-L-C-001	eme_event	5.2.3.5.1	M	
MLP-L-C-002	extension parameter	5.2.3.5.1	O	

B.1.13 Triggered Location Reporting Request

Item	Function	Reference	Status	Requirement
MLP-M-C-001	msids	5.2.3.6.1	M	
MLP-M-C-002	interval	5.2.3.6.1	O	
MLP-M-C-003	start_time	5.2.3.6.1	O	
MLP-M-C-004	stop_time	5.2.3.6.1	O	
MLP-M-C-005	duration	5.2.3.6.1	O	
MLP-M-C-006	tlrr_event	5.2.3.6.1	O	
MLP-M-C-007	qop	5.2.3.6.1	O	
MLP-M-C-008	geo_info	5.2.3.6.1	O	
MLP-M-C-009	pushaddr	5.2.3.6.1	O	
MLP-M-C-010	loc_type	5.2.3.6.1	O	
MLP-M-C-011	prio	5.2.3.6.1	O	
MLP-M-C-012	service_coverage	5.2.3.6.1	O	
MLP-M-C-014	MapRequest	5.2.3.6.1	O	
MLP-M-C-015	ReferencePoint	5.2.3.6.1	O	
MLP-M-C-016	analytic_report	5.2.3.6.1	O	
MLP-M-C-013	extension parameter	5.2.3.6.1	O	

B.1.14 Triggered Location Reporting Answer

Item	Function	Reference	Status	Requirement
MLP-N-C-001	req_id	5.2.3.6.2	M	
MLP-N-C-002	result	5.2.3.6.2	M	
MLP-N-C-003	add_info	5.2.3.6.2	O	
MLP-N-C-004	extension parameter	5.2.3.6.2	O	
MLP-N-C-005	lcs_ref	5.2.3.6.2	O	

B.1.15 Triggered Location Report

Item	Function	Reference	Status	Requirement
MLP-O-C-001	req_id	5.2.3.6.3	M	
MLP-O-C-002	trl_pos	5.2.3.6.3	M	
MLP-O-C-003	time_remaining	5.2.3.6.3	O	
MLP-O-C-004	extension parameter	5.2.3.6.3	O	
MLP-N-C-005	lcs_ref	5.2.3.6.3	O	

B.1.16 Triggered Location Reporting Stop Request

Item	Function	Reference	Status	Requirement
MLP-P-C-001	req_id	5.2.3.6.4	M	
MLP-P-C-002	msids	5.2.3.6.4	O	
MLP-P-C-003	extension parameter	5.2.3.6.4	O	
MLP-P-C-004	lcs_ref	5.2.3.6.4	O	

B.1.17 Triggered Location Reporting Stop Answer

Item	Function	Reference	Status	Requirement
MLP-Q-C-001	req_id	5.2.3.6.5	M	
MLP-Q-C-002	msids	5.2.3.6.5	O	
MLP-Q-C-003	result	5.2.3.6.5	M	
MLP-Q-C-004	add_info	5.2.3.6.5	O	
MLP-Q-C-005	extension parameter	5.2.3.6.5	O	

B.1.18 Historic Location Immediate Request

Item	Function	Reference	Status	Requirement
MLP-AC-C-002	msid	5.2.3.8.1	M	
MLP-AC-C-005	trans_id	5.2.3.8.1	O	
MLP-AC-C-005	start_time	5.2.3.8.1	O	
MLP-AC-C-005	stop_time	5.2.3.8.1	O	
MLP-AC-C-005	interval	5.2.3.8.1	O	
MLP-AC-C-005	qop	5.2.3.8.1	O	
MLP-AC-C-005	geo_info	5.2.3.8.1	O	
MLP-AC-C-010	pushaddr	5.2.3.8.1	O	
MLP-AC-C-009	prio	5.2.3.8.1	O	
MLP-AC-C-012	extension parameter	5.2.3.8.1	O	

B.1.19 Historic Location Immediate Answer

Item	Function	Reference	Status	Requirement
MLP-AD-C-001	pos	5.2.3.8.2	M	
MLP-AD-C-002	req_id	5.2.3.8.2	O	
MLP-AD-C-003	result	5.2.3.8.2	M	
MLP-AD-C-004	add_info	5.2.3.8.2	O	
MLP-AD-C-005	extension parameter	5.2.3.8.2	O	

B.1.20 Historic Location Immediate Report

Item	Function	Reference	Status	Requirement
MLP-AE-C-001	req_id	1.1.1.1.1	M	
MLP-AE-C-002	pos	1.1.1.1.1	M	
MLP-AE-C-003	extension parameter	1.1.1.1.1	O	

B.1.21 Support for Identity Elements

Item	Function	Reference	Status	Requirement
MLP-R-C-001	msid	5.2.2.1	M	
MLP-R-C-002	msid_range	5.2.2.1	O	
MLP-R-C-003	msids	5.2.2.1	O	
MLP-R-C-004	codeword	5.2.2.1	O	

Item	Function	Reference	Status	Requirement
MLP-R-C-005	esrd	5.2.2.1	O	
MLP-R-C-006	esrk	5.2.2.1	O	
MLP-R-C-007	session	5.2.2.1	O	
MLP-R-C-008	start_msid	5.2.2.1	O	
MLP-R-C-009	stop_msid	5.2.2.1	O	
MLP-R-C-010	trans_id	5.2.2.1	O	
MLP-R-C-011	msid_group	5.2.2.1	O	

B.1.22 Support for Function Elements

Item	Function	Reference	Status	Requirement
MLP-S-C-001	eme_event	1.1.1.1	O	
MLP-S-C-002	tlrr_event	1.1.1.1	O	
MLP-S-C-003	ms_action	1.1.1.1	O	
MLP-S-C-004	change_area	1.1.1.1	O	
MLP-S-C-005	target_area	1.1.1.1	O	
MLP-S-C-006	no_of_reports	1.1.1.1	O	
MLP-S-C-007	name_area	1.1.1.1	O	
MLP-S-C-008	plmn	1.1.1.1	O	
MLP-S-C-009	interval	1.1.1.1	O	
MLP-S-C-010	loc_type	1.1.1.1	O	
MLP-S-C-011	prio	1.1.1.1	O	
MLP-S-C-012	pushaddr	1.1.1.1	O	
MLP-S-C-013	req_id	1.1.1.1	O	
MLP-S-C-014	start_time	1.1.1.1	O	
MLP-S-C-015	stop_time	1.1.1.1	O	
MLP-S-C-016	duration	1.1.1.1	O	
MLP-S-C-017	url	1.1.1.1	O	
MLP-S-C-018	time_remaining	1.1.1.1	O	
MLP-S-C-019	lcs_ref	1.1.1.1	O	
MLP-S-C-020	supl_support_params	1.1.1.1	O	
MLP-S-C-021	Ip_address	1.1.1.1	O	
MLP-S-C-022	minimumIntervalTime	1.1.1.1	O	
MLP-S-C-023	velocity_event	1.1.1.1	O	
MLP-S-C-024	distance_event	1.1.1.1	O	
MLP-S-C-025	equidistance_event	1.1.1.1	O	
MLP-S-C-026	target_speed	1.1.1.1	O	
MLP-S-C-027	target_distance	1.1.1.1	O	
MLP-S-C-028	target_equidistance	1.1.1.1	O	
MLP-S-C-029	reference_object	1.1.1.1	O	
MLP-S-C-030	trigger_data"	1.1.1.1	O	
MLP-S-C-031	Aln_event	1.1.1.1	O	
MLP-S-C-032	target_serving_node	1.1.1.1	O	
MLP-S-C-033	group_condition	1.1.1.1	O	
MLP-S-C-034	persistence	1.1.1.1	O	

B.1.23 Support for Location Elements

Item	Function	Reference	Status	Requirement
MLP-T-C-001	Pos	1.1.1.1	M	
MLP-T-C-002	eme_pos	1.1.1.1	O	
MLP-T-C-003	trl_pos	1.1.1.1	O	
MLP-T-C-004	pd	1.1.1.1	M	
MLP-T-C-005	poserr	1.1.1.1	M	
MLP-T-C-022	MapData	1.1.1.1	O	
MLP-T-C-023	Base64Map	1.1.1.1	O	
MLP-T-C-024	Url	1.1.1.1	O	
MLP-T-C-025	MapRequest	1.1.1.1	O	
MLP-T-C-026	Width	1.1.1.1	O	
MLP-T-C-027	Height	1.1.1.1	O	
MLP-T-C-028	Zoom	1.1.1.1	O	
MLP-T-C-006	Time	1.1.1.1	M	
MLP-T-C-007	Alt	1.1.1.1	O	
MLP-T-C-008	Alt_unc	1.1.1.1	O	
MLP-T-C-020	civicloc	1.1.1.1	O	
MLP-T-C-021	civicloc_element	1.1.1.1	O	
MLP-T-C-009	qos_not_met	1.1.1.1	O	
MLP-T-C-010	direction	1.1.1.1	O	
MLP-T-C-011	speed	1.1.1.1	O	
MLP-T-C-012	lev_conf	1.1.1.1	O	
MLP-T-C-013	geo_info	1.1.1.1	O	
MLP-T-C-014	coordinateReferenceSystem	1.1.1.1	O	
MLP-T-C-015	identifier	1.1.1.1	O	
MLP-T-C-016	code	1.1.1.1	O	
MLP-T-C-017	codeSpace	1.1.1.1	O	
MLP-T-C-018	edition	1.1.1.1	O	
MLP-T-C-019	service_coverage	1.1.1.1	O	
MLP-T-C-029	MotionStateRequest	1.1.1.1	O	
MLP-T-C-030	Relativelocation	1.1.1.1	O	

B.1.24 Support for Result Elements

Item	Function	Reference	Status	Requirement
MLP-U-C-001	add_info	0	O	
MLP-U-C-002	result	0	M	

B.1.25 Support for Shape Elements

Item	Function	Reference	Status	Requirement
MLP-V-C-001	shape	5.2.2.5	M	MLP-V-C-002 OR MLP-V-C-003 OR MLP-V-C-004 OR MLP-V-C-005 OR MLP-V-C-006 OR MLP-V-C-007 OR MLP-V-C-008 OR MLP-V-C-009 OR MLP-V-C-010 OR MLP-V-C-011
MLP-V-C-002	Point	5.2.2.5	O	
MLP-V-C-003	LineString	5.2.2.5	O	
MLP-V-C-004	Box	5.2.2.5	O	
MLP-V-C-005	LinearRing	5.2.2.5	O	
MLP-V-C-006	Polygon	5.2.2.5	O	
MLP-V-C-007	CircularArcArea	5.2.2.5	O	
MLP-V-C-008	EllipticalArea	5.2.2.5	O	
MLP-V-C-009	MultiLineString	5.2.2.5	O	
MLP-V-C-010	MultiPoint	5.2.2.5	O	
MLP-V-C-011	MultiPolygon	5.2.2.5	O	
MLP-V-C-012	ReferencePoint	5.2.2.5	O	

B.1.26 Support for Quality of Position Elements

Item	Function	Reference	Status	Requirement
MLP-W-C-001	eqop	5.2.2.6	O	
MLP-W-C-002	qop	5.2.2.6	O	
MLP-W-C-003	ll_acc	5.2.2.6	O	
MLP-W-C-004	hor_acc	5.2.2.6	O	
MLP-W-C-005	max_loc_age	5.2.2.6	O	
MLP-W-C-006	resp_req	5.2.2.6	O	
MLP-W-C-007	resp_timer	5.2.2.6	O	
MLP-W-C-008	alt_acc	5.2.2.6	O	

B.1.27 Support for GSM Network Parameters Elements

Item	Function	Reference	Status	Requirement
MLP-X-C-001	gsm_net_param	1.1.1.1	O	
MLP-X-C-002	cgi	1.1.1.1	O	
MLP-X-C-003	neid	1.1.1.1	O	MLP-X-C-004 OR MLP-X-C-005
MLP-X-C-004	vmscid	1.1.1.1	O	
MLP-X-S-005	vlrid	1.1.1.1	O	
MLP-X-C-006	nmr	1.1.1.1	O	
MLP-X-C-007	mcc	1.1.1.1	O	
MLP-X-C-008	mnc	1.1.1.1	O	
MLP-X-C-009	ndc	1.1.1.1	O	
MLP-X-C-010	cc	1.1.1.1	O	
MLP-X-C-011	vmscno	1.1.1.1	O	
MLP-X-C-012	vlrno	1.1.1.1	O	
MLP-X-C-013	lac	1.1.1.1	O	
MLP-X-C-014	cellid	1.1.1.1	O	
MLP-X-C-015	ta	1.1.1.1	O	
MLP-X-C-016	lmsi	1.1.1.1	O	
MLP-X-C-017	imsi	1.1.1.1	O	

B.1.28 Support for Context Elements

Item	Function	Reference	Status	Requirement
MLP-Y-C-001	client	1.1.1.1	M	
MLP-Y-C-002	sessionid	1.1.1.1	O	
MLP-Y-C-003	id	1.1.1.1	M	
MLP-Y-C-004	requestor	1.1.1.1	O	
MLP-Y-C-005	pwd	1.1.1.1	O	
MLP-Y-C-006	serviceid	1.1.1.1	O	
MLP-Y-C-007	requestmode	1.1.1.1	O	
MLP-Y-C-008	subclient	1.1.1.1	O	
MLP-Y-C-009	serving_node_privacy_action	1.1.1.1	O	
MLP-Y-C-010	supported_shapes	1.1.1.1	O	

B.1.29 Service attributes

Item	Function	Reference	Status	Requirement
MLP-Z-C-001	res_type	1.1.1	O	
MLP-Z-C-002	ver	1.1.1	M	

B.1.30 Transport mechanisms

Item	Function	Reference	Status	Requirement
MLP-AA-C-001	Support of HTTP mapping	5.2.1, 1.1	M	
MLP-AA-C-002	Support of port 9210	1.1	O	
MLP-AA-C-003	Support of port 9211	1.1	O	
MLP-AA-C-004	Support of transfer over other port	1.1	O	

B.1.31 Services

Item	Function	Reference	Status	Requirement
MLP-AB-C-001	Standard Location Immediate Service	5.2.3.2	M	MLP-A-C-003 AND MLP-B-C-003 AND MLP-B-C-004
MLP-AB-C-002	Emergency Location Immediate Service	5.2.3.3	O	MLP-A-C-004 AND MLP-B-C-007
MLP-AB-C-003	Standard Location Reporting Service	5.2.3.4	O	MLP-B-C-005 AND MLP-B-C-006
MLP-AB-C-004	Emergency Location Reporting Service	5.2.3.5	O	MLP-B-C-009
MLP-AB-C-005	Triggered Location Reporting Service	5.2.3.6	O	MLP-A-C-005 AND MLP-A-C-006 AND MLP-B-C-010 AND MLP-B-C-011 AND MLP-B-C-012
MLP-AB-C-006	Historic Location Immediate Service	5.2.3.6	O	MLP-A-C-008 AND MLP-B-C-014

B.1.32 Triggered Location Reporting Pause Report

Item	Function	Reference	Status	Requirement
MLP-AC-C-001	req_id	5.2.3.6.6	M	
MLP-AC-C-002	msid	5.2.3.6.6	M	
MLP-AC-C-003	extension parameter	5.2.3.6.6	O	
MLP-AC-C-004	lcs_ref	5.2.3.6.6	O	

B.1.33 Triggered Location Reporting Query Request

Item	Function	Reference	Status	Requirement
MLP-AD-C-001	extension parameter	5.2.3.6.7	O	

B.1.34 Triggered Location Reporting Query Answer

Item	Function	Reference	Status	Requirement
MLP-AE-C-001	query_id	5.2.3.6.8	M	
MLP-AE-C-002	result	5.2.3.6.8	M	
MLP-AE-C-003	add_info	5.2.3.6.8	O	
MLP-AE-C-004	extension parameter	5.2.3.6.8	O	

B.1.35 Triggered Location Query Report

Item	Function	Reference	Status	Requirement
MLP-AF-C-001	query_id	5.2.3.6.9	M	
MLP-AF-C-002	trigger_data	5.2.3.6.9	O	
MLP-AF-C-003	extension parameter	5.2.3.6.9	O	

B.2 SCR for Server

B.2.1 Service Initiation DTD

Item	Function	Reference	Status	Requirement
MLP-A-S-001	Service Initiation	5.6.2.1	M	MLP-A-S-002 AND MLP-A-S-003
MLP-A-S-002	Header	5.6.2.1	M	
MLP-A-S-003	Standard Location Immediate Request	5.6.2.1	M	MLP-B-S-003 AND MLP-B-S-004
MLP-A-S-004	Emergency Location Immediate Request	5.6.2.1	O	MLP-B-S-007
MLP-A-S-005	Triggered Location Reporting Request	5.6.2.1	O	MLP-B-S-010 AND MLP-B-S-011 AND MLP-B-S-012
MLP-A-S-006	Triggered Location Reporting Stop Request	5.6.2.1	O	MLP-B-S-012
MLP-A-S-008	Historic Location Immediate Request	5.6.2.1	O	MLP-B-S-014
MLP-A-S-007	Extension Message	5.6.2.1	O	

B.2.2 Service Result DTD

Item	Function	Reference	Status	Requirement
MLP-B-S-001	Service Result	1.1.1.1	M	MLP-B-S-002 AND MLP-B-S-003 AND MLP-B-S-004 AND MLP-B-S-005
MLP-B-S-002	Header	1.1.1.1	O	
MLP-B-S-003	Standard Location Immediate Answer	1.1.1.1	M	
MLP-B-S-004	Standard Location Immediate Report	1.1.1.1	O	
MLP-B-S-005	Standard Location Report	1.1.1.1	O	
MLP-B-S-006	Standard Location Report Answer	1.1.1.1	O	
MLP-B-S-007	Emergency Location Immediate Answer	1.1.1.1	O	
MLP-B-S-008	Emergency Location Immediate Report	1.1.1.1	O	MLP-B-S-007
MLP-B-S-009	Emergency Location Report	1.1.1.1	O	
MLP-B-S-010	Triggered Location Reporting Answer	1.1.1.1	O	MLP-B-S-011
MLP-B-S-011	Triggered Location Report	1.1.1.1	O	MLP-B-S-010
MLP-B-S-012	Triggered Location	1.1.1.1	O	

Item	Function	Reference	Status	Requirement
	Reporting Stop Answer			
MLP-B-S-014	Historic Location Immediate Answer	1.1.1.1	O	
MLP-B-S-015	Historic Location Immediate Report	1.1.1.1	O	
MLP-B-S-016	Triggered Location Reporting Pause Report	1.1.1.1	O	
MLP-B-S-013	Extension Message	1.1.1.1	O	

B.2.3 Header

Item	Function	Reference	Status	Requirement
MLP-C-S-001	client	5.2.3.1	M	
MLP-C-S-002	sessionid	5.2.3.1	O	
MLP-C-S-003	subclient	5.2.3.1	O	
MLP-C-S-004	requestor	5.2.3.1	O	
MLP-C-S-005	supported_shapes	5.2.3.1	O	
MLP-C-S-006	serving_node_privacy_action	5.2.3.1	O	

B.2.4 Standard Location Immediate Request

Item	Function	Reference	Status	Requirement
MLP-D-S-001	msids	1.1.1.1.1	O	
MLP-D-S-002	msid	1.1.1.1.1	M	
MLP-D-S-003	codeword	1.1.1.1.1	O	
MLP-D-S-004	gsm_net_param	1.1.1.1.1	O	
MLP-D-S-005	trans_id	1.1.1.1.1	O	
MLP-D-S-006	eqop	1.1.1.1.1	O	
MLP-D-S-007	geo_info	1.1.1.1.1	O	
MLP-D-S-008	loc_type	1.1.1.1.1	O	
MLP-D-S-009	prio	1.1.1.1.1	O	
MLP-D-S-010	pushaddr	1.1.1.1.1	O	
MLP-D-S-011	service_coverage	1.1.1.1.1	O	
MLP-D-S-013	MapRequest	5.2.2.10.1	O	
MLP-D-S-014	MotionStateRequest	1.1.1.1.1	O	
MLP-D-S-015	ReferencePoint	1.1.1.1.1	O	
MLP-D-S-012	extension parameter	1.1.1.1.1	O	

B.2.5 Standard Location Immediate Answer

Item	Function	Reference	Status	Requirement
MLP-E-S-001	pos	5.2.3.2.2	M	
MLP-E-S-002	req_id	5.2.3.2.2	O	
MLP-E-S-003	result	5.2.3.2.2	M	
MLP-E-S-004	add_info	5.2.3.2.2	O	
MLP-E-S-005	extension parameter	5.2.3.2.2	O	

B.2.6 Standard Location Immediate Report

Item	Function	Reference	Status	Requirement
MLP-F-S-001	req_id	5.2.3.2.3	M	MLP-E-S-002
MLP-F-S-002	pos	5.2.3.2.3	M	
MLP-F-S-003	extension parameter	5.2.3.2.3	O	

B.2.7 Emergency Location Immediate Request

Item	Function	Reference	Status	Requirement
MLP-G-S-001	msids	5.2.3.3.1	O	
MLP-G-S-002	msid	5.2.3.3.1	M	
MLP-G-S-003	gsm_net_param	5.2.3.3.1	O	
MLP-G-S-004	trans_id	5.2.3.3.1	O	
MLP-G-S-005	esrd	5.2.3.3.1	O	
MLP-G-S-006	esrk	5.2.3.3.1	O	
MLP-G-S-007	eqop	5.2.3.3.1	O	
MLP-G-S-008	geo_info	5.2.3.3.1	O	
MLP-G-S-009	loc_type	5.2.3.3.1	O	
MLP-G-S-010	pushaddr	5.2.3.3.1	O	
MLP-G-S-012	supl_support_params	5.2.3.3.1	O	
MLP-G-S-013	MapRequest	5.2.2.11.1	O	
MLP-G-S-014	ReferencePoint	1.1.1.1.1	O	
MLP-G-S-011	extension parameter	5.2.3.3.1	O	

B.2.8 Emergency Location Immediate Answer

Item	Function	Reference	Status	Requirement
MLP-H-S-001	eme_pos	5.2.3.3.2	M	
MLP-H-S-002	req_id	5.2.3.3.2	O	
MLP-H-S-003	result	5.2.3.3.2	M	
MLP-H-S-004	add_info	5.2.3.3.2	O	
MLP-H-S-005	extension parameter	5.2.3.3.2	O	

B.2.9 Emergency Location Immediate Report

Item	Function	Reference	Status	Requirement
MLP-I-S-001	req_id	5.2.3.3.3	M	MLP-H-S-002
MLP-I-S-002	eme_pos	5.2.3.3.3	M	
MLP-I-S-003	result	5.2.3.3.3	M	
MLP-I-S-004	add_info	5.2.3.3.3	O	
MLP-I-S-005	extension parameter	5.2.3.3.3	O	

B.2.10 Standard Location Report

Item	Function	Reference	Status	Requirement
MLP-J-S-001	pos	5.2.3.4.1	M	
MLP-J-S-002	extension parameter	5.2.3.4.1	O	

B.2.11 Standard Location Report Answer

Item	Function	Reference	Status	Requirement
MLP-K-S-001	result	5.2.3.4.2	M	
MLP-K-S-002	add_info	5.2.3.4.2	O	
MLP-K-S-003	extension parameter	5.2.3.4.2	O	

B.2.12 Emergency Location Report

Item	Function	Reference	Status	Requirement
MLP-L-S-001	eme_event	5.2.3.5.1	M	
MLP-L-S-002	extension parameter	5.2.3.5.1	O	

B.2.13 Triggered Location Reporting Request

Item	Function	Reference	Status	Requirement
MLP-M-S-001	msids	5.2.3.6.1	M	
MLP-M-S-002	interval	5.2.3.6.1	O	
MLP-M-S-003	start_time	5.2.3.6.1	O	
MLP-M-S-004	stop_time	5.2.3.6.1	O	
MLP-M-S-005	duration	5.2.3.6.1	O	
MLP-M-S-006	tlrr_event	5.2.3.6.1	O	
MLP-M-S-007	qop	5.2.3.6.1	O	
MLP-M-S-008	geo_info	5.2.3.6.1	O	
MLP-M-S-009	pushaddr	5.2.3.6.1	O	
MLP-M-S-010	loc_type	5.2.3.6.1	O	
MLP-M-S-011	prio	5.2.3.6.1	O	
MLP-M-S-012	service_coverage	5.2.3.6.1	O	
MLP-M-S-014	MapRequest	5.2.3.6.1	O	
MLP-M-S-015	ReferencePoint	5.2.3.6.1	O	
MLP-M-C-016	analytic_report	5.2.3.6.1	O	
MLP-M-S-013	extension parameter	5.2.3.6.1	O	

B.2.14 Triggered Location Reporting Answer

Item	Function	Reference	Status	Requirement
MLP-N-S-001	req_id	5.2.3.6.2	M	
MLP-N-S-002	result	5.2.3.6.2	M	
MLP-N-S-003	add_info	5.2.3.6.2	O	
MLP-N-S-004	extension parameter	5.2.3.6.2	O	
MLP-N-S-005	lcs_ref	5.2.3.6.2	O	

B.2.15 Triggered Location Report

Item	Function	Reference	Status	Requirement
MLP-O-S-001	req_id	5.2.3.6.3	M	
MLP-O-S-002	trl_pos	5.2.3.6.3	M	
MLP-O-S-003	time_remaining	5.2.3.6.3	O	
MLP-O-S-004	extension parameter	5.2.3.6.3	O	
MLP-O-S-005	lcs_ref	5.2.3.6.3	O	

B.2.16 Triggered Location Reporting Stop Request

Item	Function	Reference	Status	Requirement
MLP-P-S-001	req_id	5.2.3.6.4	M	
MLP-P-S-002	msids	5.2.3.6.4	O	
MLP-P-S-003	extension parameter	5.2.3.6.4	O	
MLP-P-S-004	lcs_ref	5.2.3.6.4	O	

B.2.17 Triggered Location Reporting Stop Answer

Item	Function	Reference	Status	Requirement
MLP-Q-S-001	req_id	5.2.3.6.5	M	
MLP-Q-S-002	msids	5.2.3.6.5	O	
MLP-Q-S-003	result	5.2.3.6.5	M	
MLP-Q-S-004	add_info	5.2.3.6.5	O	
MLP-Q-S-005	extension parameter	5.2.3.6.5	O	

B.2.18 Historic Location Immediate Request

Item	Function	Reference	Status	Requirement
MLP-AC-S-002	msid	5.2.3.8.1	M	
MLP-AC-S-005	trans_id	5.2.3.8.1	O	
MLP-AC-S-005	start_time	5.2.3.8.1	O	
MLP-AC-S-005	stop_time	5.2.3.8.1	O	
MLP-AC-S-005	interval	5.2.3.8.1	O	
MLP-AC-S-005	qop	5.2.3.8.1	O	
MLP-AC-S-005	geo_info	5.2.3.8.1	O	
MLP-AC-S-010	pushaddr	5.2.3.8.1	O	
MLP-AC-S-009	prio	5.2.3.8.1	O	
MLP-AC-S-012	extension parameter	5.2.3.8.1	O	

B.2.19 Historic Location Immediate Answer

Item	Function	Reference	Status	Requirement
MLP-AD-S-001	pos	5.2.3.8.2	M	
MLP-AD-S-002	req_id	5.2.3.8.2	O	
MLP-AD-S-003	result	5.2.3.8.2	M	
MLP-AD-S-004	add_info	5.2.3.8.2	O	
MLP-AD-S-005	extension parameter	5.2.3.8.2	O	

B.2.20 Historic Location Immediate Report

Item	Function	Reference	Status	Requirement
MLP-AE-S-001	req_id	1.1.1.1.1	M	
MLP-AE-S-002	pos	1.1.1.1.1	M	
MLP-AE-S-003	extension parameter	1.1.1.1.1	O	

B.2.21 Support for Identity Elements

Item	Function	Reference	Status	Requirement
MLP-R-S-001	msid	5.2.2.1	M	
MLP-R-S-002	msid_range	5.2.2.1	O	
MLP-R-S-003	msids	5.2.2.1	O	
MLP-R-S-004	codeword	5.2.2.1	O	
MLP-R-S-005	esrd	5.2.2.1	O	
MLP-R-S-006	esrk	5.2.2.1	O	
MLP-R-S-007	session	5.2.2.1	O	
MLP-R-S-008	start_msid	5.2.2.1	O	
MLP-R-S-009	stop_msid	5.2.2.1	O	
MLP-R-S-010	trans_id	5.2.2.1	O	
MLP-R-S-011	msid_group	5.2.2.1	O	

B.2.22 Support for Function Elements

Item	Function	Reference	Status	Requirement
MLP-S-S-001	eme_event	1.1.1.1	O	
MLP-S-S-002	tlrr_event	1.1.1.1	O	
MLP-S-S-003	ms_action	1.1.1.1	O	
MLP-S-S-004	change_area	1.1.1.1	O	
MLP-S-S-005	target_area	1.1.1.1	O	
MLP-S-S-006	no_of_reports	1.1.1.1	O	
MLP-S-S-007	name_area	1.1.1.1	O	
MLP-S-S-008	plmn	1.1.1.1	O	
MLP-S-S-009	interval	1.1.1.1	O	
MLP-S-S-010	loc_type	1.1.1.1	O	
MLP-S-S-011	prio	1.1.1.1	O	
MLP-S-S-012	pushaddr	1.1.1.1	O	
MLP-S-S-013	req_id	1.1.1.1	O	
MLP-S-S-014	start_time	1.1.1.1	O	
MLP-S-S-015	stop_time	1.1.1.1	O	
MLP-S-S-016	duration	1.1.1.1	O	
MLP-S-S-017	url	1.1.1.1	O	
MLP-S-S-018	time_remaining	1.1.1.1	O	
MLP-S-S-019	lcs_ref	1.1.1.1	O	
MLP-S-S-020	supl_support_params	1.1.1.1	O	
MLP-S-S-021	ip_address	1.1.1.1	O	
MLP-S-S-022	minimumIntervalTime	1.1.1.1	O	
MLP-S-S-023	velocity_event	1.1.1.1	O	
MLP-S-S-024	distance_event	1.1.1.1	O	
MLP-S-S-025	equidistance_event	1.1.1.1	O	
MLP-S-S-026	target_speed	1.1.1.1	O	
MLP-S-S-027	target_distance	1.1.1.1	O	
MLP-S-S-028	target_equidistance	1.1.1.1	O	
MLP-S-S-029	reference_object	1.1.1.1	O	
MLP-S-S-030	trigger_data	1.1.1.1	O	
MLP-S-S-031	Aln_event	1.1.1.1	O	
MLP-S-S-032	target_serving_node	1.1.1.1	O	
MLP-S-S-033	group_condition	1.1.1.1	O	
MLP-S-S-034	persistence	1.1.1.1	O	

B.2.23 Support for Location Elements

Item	Function	Reference	Status	Requirement
MLP-T-S-001	pos	1.1.1.1	M	
MLP-T-S-002	eme_pos	1.1.1.1	O	
MLP-T-S-003	trl_pos	1.1.1.1	O	
MLP-T-S-004	pd	1.1.1.1	M	
MLP-T-S-005	poserr	1.1.1.1	M	
MLP-T-S-022	MapData	1.1.1.1	O	
MLP-T-S-023	Base64Map	1.1.1.1	O	
MLP-T-S-024	Url	1.1.1.1	O	

Item	Function	Reference	Status	Requirement
MLP-T-S-025	MapRequest	1.1.1.1	O	
MLP-T-S-026	Width	1.1.1.1	O	
MLP-T-S-027	Height	1.1.1.1	O	
MLP-T-S-028	Zoom	1.1.1.1	O	
MLP-T-S-006	time	1.1.1.1	M	
MLP-T-S-007	alt	1.1.1.1	O	
MLP-T-S-008	alt_unc	1.1.1.1	O	
MLP-T-S-020	civicloc	1.1.1.1	O	
MLP-T-S-021	civicloc_element	1.1.1.1	O	
MLP-T-S-009	qos_not_met	1.1.1.1	O	
MLP-T-S-010	direction	1.1.1.1	O	
MLP-T-S-011	speed	1.1.1.1	O	
MLP-T-S-012	lev_conf	1.1.1.1	O	
MLP-T-S-013	geo_info	1.1.1.1	O	
MLP-T-S-014	coordinateReferenceSystem	1.1.1.1	O	
MLP-T-S-015	identifier	1.1.1.1	O	
MLP-T-S-016	code	1.1.1.1	O	
MLP-T-S-017	codeSpace	1.1.1.1	O	
MLP-T-S-018	edition	1.1.1.1	O	
MLP-T-S-019	service_coverage	1.1.1.1	O	
MLP-T-S-029	MotionStateRequest	1.1.1.1	O	
MLP-T-S-030	Relativelocation	1.1.1.1	O	

B.2.24 Support for Result Elements

Item	Function	Reference	Status	Requirement
MLP-U-S-001	add_info	0	O	
MLP-U-S-002	result	0	M	

B.2.25 Support for Shape Elements

Item	Function	Reference	Status	Requirement
MLP-V-S-001	shape	5.2.2.5	M	MLP-V-S-002 OR MLP-V-S-003 OR MLP-V-S-004 OR MLP-V-S-005 OR MLP-V-S-006 OR MLP-V-S-007 OR MLP-V-S-008 OR MLP-V-S-009 OR MLP-V-S-010 OR MLP-V-S-011
MLP-V-S-002	Point	5.2.2.5	O	
MLP-V-S-003	LineString	5.2.2.5	O	
MLP-V-S-004	Box	5.2.2.5	O	
MLP-V-S-005	LinearRing	5.2.2.5	O	
MLP-V-S-006	Polygon	5.2.2.5	O	
MLP-V-S-007	CircularArcArea	5.2.2.5	O	
MLP-V-S-008	EllipticalArea	5.2.2.5	O	
MLP-V-S-009	MultiLineString	5.2.2.5	O	
MLP-V-S-010	MultiPoint	5.2.2.5	O	
MLP-V-S-011	MultiPolygon	5.2.2.5	O	
MLP-V-S-012	ReferencePoint	5.2.2.5	O	

B.2.26 Support for Quality of Position Elements

Item	Function	Reference	Status	Requirement
MLP-W-S-001	eqop	5.2.2.6	O	
MLP-W-S-002	qop	5.2.2.6	O	
MLP-W-S-003	ll_acc	5.2.2.6	O	
MLP-W-S-004	hor_acc	5.2.2.6	O	
MLP-W-S-005	max_loc_age	5.2.2.6	O	
MLP-W-S-006	resp_req	5.2.2.6	O	
MLP-W-S-007	resp_timer	5.2.2.6	O	
MLP-W-S-008	alt_acc	5.2.2.6	O	

B.2.27 Support for Network Parameters Elements

Item	Function	Reference	Status	Requirement
MLP-X-S-001	gsm_net_param	1.1.1.1	O	
MLP-X-S-002	cgi	1.1.1.1	O	
MLP-X-S-003	neid	1.1.1.1	O	MLP-X-S-004 OR MLP-X-S-005
MLP-X-S-004	vmscid	1.1.1.1	O	
MLP-X-S-005	vlrid	1.1.1.1	O	
MLP-X-S-006	nmr	1.1.1.1	O	
MLP-X-S-007	mcc	1.1.1.1	O	
MLP-X-S-008	mnc	1.1.1.1	O	
MLP-X-S-009	ndc	1.1.1.1	O	
MLP-X-S-010	cc	1.1.1.1	O	
MLP-X-S-011	vmscno	1.1.1.1	O	
MLP-X-S-012	vlrno	1.1.1.1	O	
MLP-X-S-013	lac	1.1.1.1	O	
MLP-X-S-014	cellid	1.1.1.1	O	
MLP-X-S-015	ta	1.1.1.1	O	
MLP-X-S-016	lmsi	1.1.1.1	O	
MLP-X-S-017	imsi	1.1.1.1	O	

B.2.28 Support for Context Elements

Item	Function	Reference	Status	Requirement
MLP-Y-S-001	client	1.1.1.1	M	
MLP-Y-S-002	sessionid	1.1.1.1	O	
MLP-Y-S-003	id	1.1.1.1	O	
MLP-Y-S-004	requestor	1.1.1.1	O	
MLP-Y-C-009	applicationid	1.1.1.1	O	
MLP-Y-S-005	pwd	1.1.1.1	O	
MLP-Y-S-006	serviceid	1.1.1.1	O	
MLP-Y-S-007	requestmode	1.1.1.1	O	
MLP-Y-S-008	subclient	1.1.1.1	O	
MLP-Y-S-009	serving_node_pricacy_action	1.1.1.1	O	
MLP-Y-S-010	supported_shapes	1.1.1.1	O	

B.2.29 Service attributes

Item	Function	Reference	Status	Requirement
MLP-Z-S-001	res_type	1.1.1	M	
MLP-Z-S-002	ver	1.1.1	M	

B.2.30 Transport mechanisms

Item	Function	Reference	Status	Requirement
MLP-AA-S-001	Support of HTTP mapping	5.2.1, 1.1	M	
MLP-AA-S-002	Support of port 9210	1.1	O	
MLP-AA-S-003	Support of port 9211	1.1	O	
MLP-AA-S-004	Support of transfer over other port	1.1	O	

B.2.31 Services

Item	Function	Reference	Status	Requirement
MLP-AB-S-001	Standard Location Immediate Service	5.2.3.2	M	MLP-A-S-003 AND MLP-B-S-003
MLP-AB-S-002	Emergency Location Immediate Service	5.2.3.3	O	MLP-A-S-004 AND MLP-B-S-004
MLP-AB-S-003	Standard Location Reporting Service	5.2.3.4	O	MLP-B-S-005 AND MLP-B-S-006
MLP-AB-S-004	Emergency Location Reporting Service	5.2.3.5	O	MLP-B-S-009
MLP-AB-S-005	Triggered Location Reporting Service	5.2.3.6	O	MLP-A-S-005 AND MLP-A-S-006 AND MLP-B-S-010 AND MLP-B-S-011 AND MLP-B-S-012
MLP-AB-S-006	Historic Location Immediate Service	5.2.3.6	O	MLP-A-S-008 AND MLP-B-S-014

B.2.32 Triggered Location Reporting Pause Report

Item	Function	Reference	Status	Requirement
MLP-AC-S-002	msid	5.2.3.6.6	M	
MLP-AC-S-001	req_id	5.2.3.6.6	M	
MLP-AC-S-003	extension parameter	5.2.3.6.6	O	
MLP-AC-S-004	lcs_ref	5.2.3.6.6	O	

B.2.33 Triggered Location Reporting Query Request

Item	Function	Reference	Status	Requirement
MLP-AD-S-001	extension parameter	5.2.3.6.7	O	

B.2.34 Triggered Location Reporting Query Answer

Item	Function	Reference	Status	Requirement
MLP-AE-S-001	query_id	5.2.3.6.8	M	
MLP-AE-S-002	result	5.2.3.6.8	M	
MLP-AE-S-003	add_info	5.2.3.6.8	O	
MLP-AE-S-004	extension parameter	5.2.3.6.8	O	

B.2.35 Triggered Location Query Report

Item	Function	Reference	Status	Requirement
MLP-AF-S-001	query_id	5.2.3.6.9	M	
MLP-AF-S-002	trigger_data	5.2.3.6.9	O	
MLP-AF-S-003	extension parameter	5.2.3.6.9	O	