Mobile Location Service Requirements

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Open Mobile Alliance

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1. Scope (Informative)

This document describes the requirements for the Mobile Location Service V1.1 (MLS V1.1), which consists of the Mobile Location Protocol V3.2 (MLP V3.2), Roaming Location Protocol (RLP V1.0) and Location Privacy Checking Protocol (PCP V1.0). The changes relative MLS V1.0 are described in section 4.

2. References

2.1 Normative References

[22.071]	"Location Services (LCS); Service description; Stage 1", 3GPP TS 22.071 Release 6, URL: http://www.3gpp.org/ftp/Specs/latest/Rel-6/22_series/
[23.271]	"Functional stage 2 description of Location Services (LCS)", 3GPP TS 23.271 Release 6, URL: http://www.3gpp.org/ftp/Specs/latest/Rel-6/23_series/
[PRIVACY RD]	"Privacy Requirements for Mobile Services", Open Mobile Alliance™, OMA-RD-Privacy-V1_0, URL: http://www.openmobilealliance.org/
[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL: http://www.ietf.org/rfc/rfc2119.txt
[SUPL RD]	" Secure User Plane Location Requirements", Open Mobile Alliance™, OMA-RD-SUPL-V1_0, URL: http://www.openmobilealliance.org/

2.2 Informative References

[29.002]	"Mobile Application Part (MAP) specification", 3GPP TS 29.002 Release 6, URL: http://www.3gpp.org/ftp/Specs/latest/Rel-6/29_series/

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.

3.2 Definitions

CAMEL	CAMEL is a network functionality, which provides the mechanisms of Intelligent Network to a mobile user. See also [23.271].
Cell Global Identifier	Indentity of a cell in GSM network.
Le	Interface between Location Server and LCS Client in 3GPP mobile networks. See also [23.271]
Lg	Interface between Location Server and Core Network in 3GPP mobile networks. See also [23.271]
Location Server	Software and/or hardware entity offering location capabilities.
Lr	Interface between Location Servers. See also [23.271]
Network Measurement Report	The report of measurements performed by terminals in GSM mobile networks that are sent from terminal to mobile network.
network specific parameter	Parameters, extracted from the mobile network, that can be used in a Position Calculation function.
Pseudonym	A fictitious identity, which may be used to conceal the true identity (i.e. MSISDN and IMSI) of a target UE from the requestor and the LCS client, or to conceal the true identity of the requestor or the target.
SUPL Enabled Terminal (SET)	A device that is capable of communicating with a SUPL network using the SUPL interface. Examples of this could be a UE in UMTS, an MS in GSM or CDMAIS-95, or a PC over an IP-based transport. See also [SUPL RD]
SUPL Provider	Mobile Network Operator, provides location assistance data to the SUPL Agent and optionally calculates the SET location. See also [SUPL RD]
Target	The entity being located. Can be a child, an employee, a friend, a machine, a car etc.
Timing Advance	Parameter in GSM network indicating distance between Base Station and terminal.
Verinym	True identity, i.e. MSISDN or IMSI, of the target or requestor.

3.3 Abbreviations

GMLC	Gateway Mobile Location Server. See also [23.271]
GPS	Global Positioning System
HPLMN	Home PLMN. See also [23.271]
LCS	LoCation Services. See also [23.271]
MLP	Mobile Location Protocol, the protocol for the 3GPP Le interface. See also [23.271]
MLS	Mobile Location Service
OMA	Open Mobile Alliance
OWSER	OMA Web Services Enabler
PCE	Privacy Checking Entity, equivalent to 3GPP PPR (Privacy Profile Register), responsible for checking the privacy settings of a target [23.271].

PCP	Location Privacy Checking Protocol, the protocol for the 3GPP Lpp and Lid interfaces. See also [23.271].
PLMN	Public Land Mobile Network.
PMD	Pseudonym Mediation Device, an entity responsible for turning pseudonyms into verinyms and verinyms into pseudonyms [23.271].
RLP	Roaming Location Protocol, the protocol for the 3GPP Lr interface. See also [23.271]
SUPL	Secure User Plane Location
VPLMN	Visited PLMN. See also [23.271]

4. Introduction (Informative)

OMA continues the work started in LIF (Location Interoperability Forum) and, at the same time, broadens its scope and maintains all location specifications owned by OMA.

The OMA Mobile Location Service V1.1 (MLS V1.1) consists of a set of location specifications complying with 3GPP Release 6 LCS Specification. The set of specifications in MLS V1.1 consist of MLP V3.2, RLP V1.0 and PCP V1.0.

MLS V1.1 was created as the specification for PCP V1.0 was not included in MLS V1.0. The requirement for MLS V1.0 and V1.1 are the same apart from that the PCP specific requirements, section 6.1.3, have been restructured and clarified. As the specification for PCP V1.0 was not included the PCP specific requirements was not fulfilled in MLS V1.0. This is however not visible in the Requirement Document for MLS V1.0 as, at the time of drafting, Requirement Documents did not include information of requirement fulfilment.

MLP V3.2 describes the protocol between an MLS client and the Location Server. In the 3GPP context, MLP was chosen to be an instantiation of the stage 3 specifications for the Le reference point [23.271].

RLP V1.0 describes the protocol between two Location Servers. In the 3GPP context, RLP V1.0 will be an instantiation of the stage 3 specifications for the Lr reference point [23.271]. Additionally, RLP V1.0 will be an instantiation of a reference point between SUPL Providers with the purpose to transport information between SUPL Providers to enable positioning of roaming SUPL Enabled Terminals. Examples of such information are coarse position used when generating GPS assistance data or the actual GPS assistance data.

PCP V1.0 describes the protocol between the Location Server and a Privacy Checking Entity (PCE). In the 3GPP context, PCP V1.0 will be an instantiation of the stage 3 specifications for the Lid/Lpp reference point [23.271].

5. Use Cases   (Informative)

The basic use cases for MLP V3.2 and RLP V1.0 are described in [22.071] and [23.271]. Specific use cases for SUPL roaming are shown in [SUPL RD]. Use Cases for PCP V1.0 are given in sections 5.1 and 5.2 below.

5.1   Use Case Location Privacy Checking Control

5.1.1   Short Description

This use case describes the Location Privacy Checking Control procedure.

5.1.2   Actors

- Positioning target (target to be positioned)

- Application (End-user application for location services)

- MLS Enabler implementation (Providing location data)

5.1.2.1   Actor Specific Issues

- Positioning target (target to be positioned)

  The target is associated with a set of rules regarding privacy.

- Application (End-user application for location services)

  Application asks for target's location.

- MLS Enabler implementation (Providing location data)

  MLS Enabler implementation provides location data according to a set of privacy rules.

5.1.2.2   Actor Specific Benefits

- Positioning target (target to be positioned)

  Target is willing to provide its location data under predefined conditions stated in the privacy rules.

- Application (End-user application for location services)

  Application benefits from location data with the target's consent.

- Location Server (Providing location data)

  Location Server needs to check privacy rules before providing location data.

- PCE (Privacy Checking Entity)

  PCE has the responsibility to provide Location Server with privacy checking control.

5.1.3   Pre-conditions

An application asks the MLS Enabler implementation for the position of a target. The target is associated with a set of privacy rules.

5.1.4   Post-conditions

The application can perform its task and the target's privacy is ensured.

5.1.5   Normal Flow

1. An application sends a location request to the MLS Enabler implementation.

2. The MLS Enabler implementation performs a privacy control.

3. The MLS Enabler implementation sends a location response to the application.

5.2   Use Case Pseudonym/Verinym Aquisition

5.2.1   Short Description

The MLS Enabler allows for verinyms to be translated into pseudonyms and pseudonyms to be translated into verinyms. This use case describes the Pseudonym to Verinym translation procedure.

5.2.2   Actors

- Positioning target (target to be positioned)

- Application (End-user application for location services)

- MLS Enabler implementation (Providing location data)

5.2.2.1   Actor Specific Issues

- Positioning target (target to be positioned)

  The target is represented by a pseudonym to preserve his/her privacy.

- Application (End-user application for location services)

  The application makes location requests on targets represented by pseudonyms.

- MLS Enabler implementation (Providing location data)

  MLS Enabler implementation needs to resolve pseudonyms into verinyms in order to perform a location procedure. The MLS Enabler implementation contains relation mappings between pseudonyms and verinyms.

5.2.2.2   Actor Specific Benefits

- Positioning target (target to be positioned)

  Target is willing to provide its location data if he/she can be anonymous (i.e. using a pseudonym).

- Application (End-user application for location services)

  Application benefits from location data.

- MLS Enabler implementation (Providing location data)

  MLS Enabler implementation can serve location requests using pseudonyms.

5.2.3   Pre-conditions

An application asks the location server for the position of a target using a pseudonym for the target. The target is associated with a verinym/pseudonym in the MLS Enbler implementation.

5.2.4   Post-conditions

The application can perform its task and the target's privacy is ensured.

5.2.5   Normal Flow

1. An application sends a location request to a MLS Enabler implementation using a pseudonym for the target to be located.

2. The MLS Enabler implementation resolves the pseudonym into a verinym.

3. MLS Enabler implementation performs the location procedure and afterwards transforms the verinym into the corresponding pseudonym.

4. MLS Enabler implementation sends a location response to the application with the pseudonym of the target.

6. Requirements   (Normative)

6.1   High-Level Functional Requirements

6.1.1   General requirements

Label	Description	Enabler Release
G1	MLS SHALL fulfil the requirements outlined in detail in [22.071] and [23.271].	MLS V1.1

Table 1: High-Level Functional General Requirements

6.1.2   RLP specific requirements

Label	Description	Enabler Release
R1	RLP SHALL allow transport of SUPL specific parameters between SUPL Providers for roaming SUPL Enabled Terminals.	MLS V1.1
R2	The 3GPP LCS architecture specifies the Position Calculation Function to reside within the radio access network, see [23.271]. It also specifies that the GMLC receives a calculated location estimate over the Lg interface in a manner independent of the method used for positioning. However, many current deployments associate the Position Calculation Function with the GMLC. In such deployments, some 'raw' type of information is extracted by various means from the mobile network, and the location is calculated in the Position Calculation Function associated with the GMLC. Also some of this information may be obtained in the process of obtaining routing information used for routing the location request to the correct GMLC. The 'raw' information for location calculation purposes include but is not limited to Cell Global Identifier, Timing Advance and Network Measurement Report. However, normally only the VPLMN has knowledge of the topology of the radio network and consequently only the VPLMN can utilize this information to calculate a location estimate. Hence, RLP SHALL allow network specific parameters beyond [22.071] and [23.271] to be conveyed between the Location Servers.	MLS V1.1
R3	The exact mechanism to extract such parameters is considered beyond the scope of this specification but MAY include CAMEL/MAP operations such as AnyTimeInterrogation and ProvideSubscriberInformation as outlined in [29.002].	MLS V1.1
R4	The use of network specific parameters outlined in Requirement 2. MUST NOT affect the message sequences as specified in [23.271].	MLS V1.1
R5	A requesting Location Server MAY include such network specific parameters in the request but is not required to.	MLS V1.1
R6	If the Visited Location Server received some network specific parameters via RLP, it MAY utilize it for the purpose of calculating a location estimate. Note, the Visited Location Server MAY use some other mean to obtain/calculate the location estimate.	MLS V1.1
R7	The Position Calculation Function SHALL be considered beyond the scope of MLS.	MLS V1.1

Table 2: High-Level Functional RLP specific Requirements

6.1.3   PCP specific requirements

Label	Description	Enabler Release
P1	The requirements for the PCP are described in [23.271] and [22.071] and comply with [PRIVACY RD].	MLS V1.1
P2	If PCP functionality is offered as a Web Service, it SHALL use the OWSER framework.	MLS V1.1
P3	PCP SHALL be considered as part of the generic privacy requirements to support other OMA service enablers as necessary.	MLS V1.1
P4	PCP SHALL be written in a manner so that it is applicable in environments other than 3GPP	MLS V1.1

Table 3: High-Level Functional PCP specific Requirements

Appendix A.   Change History   (Informative)

A.1   Approved Version History

Reference	Date	Description
n/a	n/a	No prior version –or- No previous version within OMA

A.2   Draft/Candidate Version 1.1 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-RD-MLS-V1_1	17 Oct 2005	All	Based on OMA-RD-MLS-V1_0-20050510-C. Content moved to latest available template. Section 6 complemented with information on which Enabler Release is fulfilling requirements.
	01 Dec 2005	3.1	Resolution according to OMA-RDRR-MLS-V1_1-20051201-D: Third paragraph deleted
	12 Feb	3.3 4 5 6.1	Content moved to latest available template. Following Change Reguests implemented: - OMA-LOC-2006-0038R01-CR-MLS_RD_1_1_ResolveComment1and4to6 - OMA-LOC-2006-0039R01 CR MLS 1.1 RD Resolve Comments 2 and 3 - OMA-LOC-2006-0040-CR-MLS_RD_1_1_ResolveComment7
Candidate Versions OMA-RD-MLS-V1_1	04 Apr		document changed to candidate following TP approval (22 March-4 April 2006 R&A)
	06 Sep	All	Inclusion of CR: OMA-LOC-2006-0281-CR_MLS_RD_1_1_Resolve_ConRev_Comments Editorial clean-up to sort the abbreviations, references and definitions tables in ascending alphanumeric order.