



# **Enabler Release Definition for Secure User Plane Location (SUPL)**

**Candidate Version 3.0 – 21 Sep 2010**

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**Open Mobile Alliance**  
**OMA-ERELED-SUPL-V3\_0-20100921-D**

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## Contents

1. SCOPE .....	4
2. REFERENCES .....	5
2.1 NORMATIVE REFERENCES .....	5
2.2 INFORMATIVE REFERENCES .....	5
3. TERMINOLOGY AND CONVENTIONS .....	6
3.1 CONVENTIONS .....	6
3.2 DEFINITIONS .....	6
3.3 ABBREVIATIONS .....	6
4. RELEASE VERSION OVERVIEW .....	9
4.1 VERSION 1.0 FUNCTIONALITY .....	9
4.2 VERSION 2.0 FUNCTIONALITY .....	9
5. DOCUMENT LISTING FOR SUPL 3.0 .....	12
6. OMNA CONSIDERATIONS .....	13
7. CONFORMANCE REQUIREMENTS NOTATION DETAILS .....	14
8. ERDEF FOR SUPL 3.0 - CLIENT REQUIREMENTS .....	15
9. ERDEF FOR SUPL 3.0 - SERVER REQUIREMENTS .....	16
APPENDIX A. CHANGE HISTORY (INFORMATIVE) .....	17
A.1 APPROVED VERSION HISTORY .....	17
A.2 DRAFT/CANDIDATE VERSION 3.0 HISTORY .....	17

## Figures

Figure 1: UserPlane Location Protocol .....	10
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## Tables

Table 1: Listing of Documents in SUPL 3.0 Enabler .....	12
Table 2: ERDEF for SUPL 3.0 Client-side Requirements .....	15
Table 3: ERDEF for SUPL 3.0 Server-side Requirements .....	16

# 1. Scope

The scope of this document is limited to the Enabler Release Definition of Secure User Plane Location (SUPL) 3.0 according to OMA Release process and the Enabler Release specification baseline listed in section 5.

## 2. References

### 2.1 Normative References

- [23.271] 3GPP TS 23.271 Release 6,  
URL:[http://www.3gpp.org/ftp/Specs/latest/Rel-6/23\\_series/](http://www.3gpp.org/ftp/Specs/latest/Rel-6/23_series/)
- [DMAccDDF] “OMA SUPL Managed Object DDF”, Version 2.0, Open Mobile Alliance™. OMA-SUP-MO\_SUPL-V2\_0.  
URL:<http://www.openmobilealliance.org/>
- [DMDDFDTD] “OMA DM Device Description Framework DTD”, Version 1.2, Open Mobile Alliance™. OMA-SUP-dtd\_dm\_ddf-v1\_2.  
URL:<http://www.openmobilealliance.org/>
- [IOPPROC] “OMA Interoperability Policy and Process”, Version 1.9, Open Mobile Alliance™, OMA-ORG-IOP-Process-V1\_9,  
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>
- [RFC2119] “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997,  
URL:<http://www.ietf.org/rfc/rfc2119.txt>
- [RLP 1.0] “Roaming Location Protocol ”, Version 1.0, Open Mobile Alliance™, OMA-TS-RLP-V1\_0  
URL:<http://www.openmobilealliance.org/>
- [SCR RULES] “SCR Rules and Procedures”, Open Mobile Alliance™, OMA-ORG-SCR\_Rules\_and\_Procedures,  
URL:<http://www.openmobilealliance.org/>
- [SUPL 1.0 AD] “SUPL Architecture Document”, Version 1.0, Open Mobile Alliance™, OMA-AD-SUPL-V1\_0  
URL:<http://www.openmobilealliance.org/>
- [SUPL AD] “SUPL Architecture Document”, Version 2.0, Open Mobile Alliance™, OMA-AD-SUPL-V2\_0  
URL:<http://www.openmobilealliance.org/>
- [SUPL MO] “OMA Management Object for SUPL”, Version 2.0, Open Mobile Alliance™, OMA-TS-SUPL-MO-V2\_0  
URL:<http://www.openmobilealliance.org/>
- [SUPL RD] “SUPL Requirements Document”, Version 2.0, Open Mobile Alliance™, OMA-RD-SUPL-V2\_0  
URL:<http://www.openmobilealliance.org/>
- [SUPL TS-ILP] “UserPlane Location Protocol ”, Version 2.0, Open Mobile Alliance™, OMA-TS-ILP-V2\_0  
URL:<http://www.openmobilealliance.org/>
- [SUPL TS-ULP] “UserPlane Location Protocol ”, Version 2.0, Open Mobile Alliance™, OMA-TS-ULP-V2\_0  
URL:<http://www.openmobilealliance.org/>
- [SUPL1.0 RD] “SUPL Requirements Document”, Version 1.0, Open Mobile Alliance™, OMA-RD-SUPL-V1\_0  
URL:<http://www.openmobilealliance.org/>

### 2.2 Informative References

- [OMADICT] “Dictionary for OMA Specifications”, Version 2.8, Open Mobile Alliance™, OMA-ORG-Dictionary-V2\_8, URL:<http://www.openmobilealliance.org/>

## 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”, "Release Version Overview" and “Conformance Requirements Notation Details”, are normative, unless they are explicitly indicated to be informative.

The formal notation convention used in sections 8 and 9 to formally express the structure and internal dependencies between specifications in the Enabler Release specification baseline is detailed in [SCRRULES].

### 3.2 Definitions

<b>Enabler Release</b>	Collection of specifications that combined together form an enabler for a service area, e.g. a download enabler, a browsing enabler, a messaging enabler, a location enabler, etc. The specifications that are forming an enabler should combined fulfil a number of related market requirements.
<b>Minimum Functionality Description</b>	Description of the guaranteed features and functionality that will be enabled by implementing the minimum mandatory part of the Enabler Release.

### 3.3 Abbreviations

<b>AD</b>	Architecture Document
<b>AFLT</b>	Advanced Forward Link Trilateration
<b>A-GANSS</b>	Assisted Galileo and Additional Navigation Satellite Systems
<b>A-GNSS</b>	Assisted Global Navigation Satellite System
<b>A-GPS</b>	Assisted GPS
<b>API</b>	Application Programming Interface
<b>EOTD</b>	Enhanced Observed Time Difference
<b>ERDEF</b>	Enabler Requirement Definition
<b>ERELED</b>	Enabler Release Definition
<b>E-SLP</b>	Emergency SLP
<b>FQDN</b>	Fully Qualified Domain Name
<b>GNSS</b>	Global Navigation Satellite System
<b>GPS</b>	Global Positioning System
<b>ILP</b>	Internal Location Protocol
<b>HLIA</b>	Historical Location Immediate Request
<b>HLIR</b>	Historical Location Immediate Answer
<b>H-SLC</b>	Home SLC
<b>H-SLP</b>	Home SLP
<b>H-SPC</b>	Home SPC
<b>HTTP</b>	Hypertext Transfer Protocol
<b>HTTPS</b>	HTTP Secure
<b>IETF</b>	Internet Engineering Task Force

<b>IMSI</b>	International Mobile Subscriber Identity
<b>IP</b>	Internet Protocol
<b>LCS</b>	Location Services
<b>LTE</b>	Long Term Evolution
<b>MAC</b>	Message Authentication Code
<b>MC</b>	Message Center
<b>MLP</b>	Mobile Location Protocol
<b>MLS</b>	Mobile Location Services
<b>MNO</b>	Mobile Network Operator
<b>MSISDN</b>	Mobile Subscriber ISDN Number
<b>OMA</b>	Open Mobile Alliance
<b>OTDOA</b>	Observed Time Difference of Arrival
<b>PAP</b>	Push Access Protocol
<b>PC</b>	Personal Computer
<b>PLMN</b>	Public Land Mobile Network
<b>POTAP</b>	WAP Push Over The Air Protocol
<b>PPG</b>	Push Proxy Gateway
<b>PSK-TLS</b>	Pre-Shared Key Ciphersuites for Transport Layer Security
<b>QoP</b>	Quality of Position
<b>RD</b>	Requirement Document
<b>RLP</b>	Roaming Location Protocol
<b>RRC</b>	Radio Resource Control
<b>RRLP</b>	Radio Resource LCS Protocol
<b>R-SLP</b>	Requesting SLP
<b>SADF</b>	SUPL Assistance Delivery Function
<b>SCF</b>	SUPL Charging Function
<b>SET</b>	SUPL Enabled Terminal
<b>SIF</b>	SUPL Initiation Function
<b>SIP</b>	Session Initiation Protocol
<b>SLC</b>	SUPL Location Center
<b>SLIA</b>	Standard Location Immediate Answer
<b>SLIR</b>	Standard Location Immediate Request
<b>SLIRep</b>	Standard Location Immediate Report
<b>SLP</b>	SUPL Location Platform
<b>SMLC</b>	Serving Mobile Location Center
<b>SMPP</b>	Short Message Peer to peer Protocol
<b>SMS</b>	Short Message Service
<b>SMSC</b>	Short Message Service Center
<b>SPC</b>	SUPL Positioning Center
<b>SPCF</b>	SUPL Position Calculation Function

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<b>SPF</b>	SUPL Privacy Function
<b>SRLIA</b>	Standard Roaming Location Immediate Answer
<b>SRLIR</b>	Standard Roaming Location Immediate Request
<b>SRRF</b>	SUPL Reference Retrieval Function
<b>SRSF</b>	SUPL Roaming Support Function
<b>SSF</b>	SUPL Security Function
<b>SSMF</b>	SUPL Service Management Function
<b>SSPF</b>	SUPL SET Provisioning Function
<b>SSRLIA</b>	Standard SUPL Roaming Location Immediate Answer
<b>SSRLIR</b>	Standard SUPL Roaming Location Immediate Request
<b>SSRP</b>	Standard SUPL Roaming Position
<b>SUPL</b>	Secure User Plane Location
<b>TD-SCDMA</b>	Time Division-Synchronous Code Division Multiple Access
<b>TLS</b>	Transport Layer Security
<b>UDP</b>	User Datagram Protocol
<b>UE</b>	User Equipment
<b>UICC</b>	Universal Integrated Circuit Card
<b>UMB</b>	Ultra Mobile Broadband
<b>URL</b>	Uniform Resource Locator
<b>V-SLC</b>	Visited SLC
<b>V-SPC</b>	Visited SPC
<b>V-SLP</b>	Visited SLP
<b>WAP</b>	Wireless Application Protocol
<b>WCDMA</b>	Wideband Code Division Multiple Access



## 4. Release Version Overview

This document outlines the Enabler Release Definition for SUPL Enabler and the respective conformance requirements for clients and servers implementing claiming compliance to it as defined by Open Mobile Alliance across the specification baseline.

SUPL V2.0 describes the protocol between a SUPL Enabled Terminal (SET) and SUPL Location Platform (SLP) and the protocol between SLC and SPC.

Communication between SET and SLP is transported over a secured IP connection, with one exception: for network initiated SUPL transactions the SUPL INIT message shall be sent as an MT SMS [TIA-637] using a dedicated Teleservice Identifier [TIA-41] for CDMA/HRPD/UMB, for GSM/WCDMA/TD-SCDMA/LTE, the WDP [WAP WDP] framing SHALL be used for MT SMS, and for WLAN/I-WLAN/WiMAX/I-WiMAX [UDP/IP] framing SHALL be used. For GSM/WCDMA/TD-SCDMA/LTE, a SUPL INIT message can also be sent via WAP Push, where the Push message from the PPG to SET shall follow the WAP Push specifications as per [WAP POTAP].

SUPL draws on support from RLP, a protocol specification from the OMA MLS Enabler. RLP is used such that SLP's from different SUPL providers can exchange information for positioning of roaming subscribers.

### 4.1 Version 1.0 Functionality

SUPL V1.0 supports immediate positioning procedures for GSM, WCDMA/TD-SCDMA and CDMA networks. It supports the terminal based positioning methods defined for GSM, WCDMA/TD-SCDMA and CDMA such as A-GPS, EOTD and Cid. The protocol between SLC and SPC is not defined in SUPL V1.0

SUPL V1.0 supports the following modes of operation for selected deployments:

- Proxy flows for GSM/WCDMA/TD-SCDMA deployments
- Proxy flows for CDMA/CDMA2000 deployments
- Non-proxy flows for CDMA/CDMA2000 deployments

### 4.2 Version 2.0 Functionality

SUPL 2.0 adds a number of features to SUPL V1.0. The major functional enhancements are:

- Triggered positioning procedures, both periodic and area event.
- Emergency positioning procedures.
- Support of A-GANSS positioning method and improvements to enhanced cell id positioning method
- Support of I-WLAN, WiMAX, I-WiMAX, HRPD/UMB, LTE networks.
- Positioning procedures for delivery to third party and retrieval of location of another SET.

In addition the protocol between SLC and SPC, i.e. the ILP, is defined.

#### 4.2.1 User Plane Location Protocol (ULP)

The UserPlane Location Protocol (ULP) is a protocol-level instantiation of the Lup reference point. The protocol is used between the SLP (SUPL Location Platform) and a SET (SUPL Enabled Terminal). For more details about SUPL Requirements refer to [SUPL RD]. For more details about SUPL architecture and call-flows, refer to [SUPL AD]

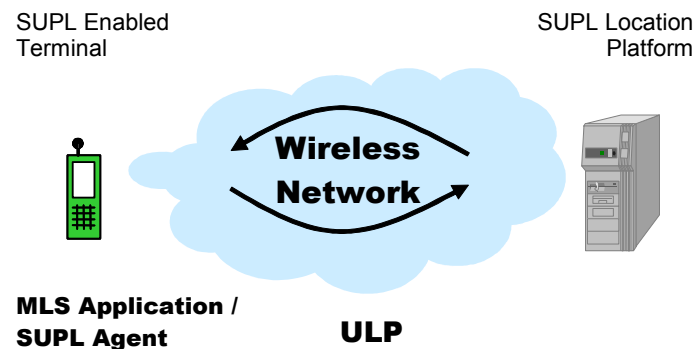


Figure 1: UserPlane Location Protocol

Possible realizations of a SUPL Location Platform functionality are within the GMLC, which is the Location Server defined in GSM and UMTS, and the MPC, which is defined in ANSI standards. Since the SUPL Location Platform should be regarded as a logical entity, other implementations are possible.

Depending which SUPL Agent initiates the dialogue, a SUPL INIT message is sent to the SET (network initiated), or a SUPL START message is sent to the SLP (SET initiated).

ULP can be implemented using various transport mechanisms. Currently, the only mapping defined is a mapping to TCP, with the following exception: the SUPL INIT message is transported over WAP Push or MT SMS.

## 4.2.2 Internal Location Protocol (ILP)

The function of the Lp reference point is logically separated into the Positioning Control Function and the Positioning Data Function

## 4.2.3 Roaming Location Protocol (RLP)

RLP is an element of the OMA MLS Enabler, and facilitates the SUPL roaming scenarios. RLP is also known as Inter-Location Server Mobile Location Protocol.

Functional Requirements for both Application to Location Server interface and inter-Location Server interface for 3GPP networks may be found in 23.271 Rel6 [23.271]. However, those parts of RLP which are used by SUPL are specified in a way that they can be used by wireless networks other than 3GPP.

RLP can be implemented using various transport mechanisms. Currently, the only mapping defined is a mapping to HTTP.

## 4.3 Version 3.0 Functionality

SUPL 3.0 adds a number of features to SUPL V2.0. The major functional enhancements are:

- Improved Location for IP Emergency Calls
- Improved Location performance
- Triggered Location Enhancement
- Improved Indoor Location Accuracy
- SET to SET Location
- Authentication Enhancements
- Privacy Enhancements
- Additional access networks

- Support for Extended Location Information

## 5. Document Listing for SUPL 3.0

This section is normative.

Doc Ref	Permanent Document Reference	Description
<b>Requirement Document</b>		
[SUPL3.0_RD]	OMA-RD-SUPL-V3_0-20100921-C	Requirement Document for SUPL 3.0 Enabler
<b>Architecture Document</b>		
<b>Technical Specifications</b>		
<b>Supporting Files</b>		

Table 1: Listing of Documents in SUPL 3.0 Enabler

## 6. OMNA Considerations

<< This section is to be used to describe any OMNA items included in the release. This would include, among others:

- Usage of OMA-based Uniform Resource Names (URNs) (including those used as namespace identifiers in Schemas)
- AppIDs for Application Characteristics (AC)
- Managed Object (MO) information for the MO registry
- ISO Object IDs
- PUSH Application Ids
- WAP Wireless Session Protocol (WSP) Content Types
- Presence <service-description> assignments
- Uniform Resource Identifier (URI)-List Registered Usage Names (for XDM)

The format of this section will be left up to the release owners to account for the particular needs they may run into. It should be clear from the written material, though, as to the set of OMNA items needed.

If a new OMNA registry is needed to support the release - clearly this should have been worked with the REL Committee before submitting a Release Document. Failure to do so may result in delays as the required tables are worked up and made publicly available. Another risk is that the table desired is not supported by OMNA (is not a registry type table) and the group will need to re-think how they intend to resolve their needs.

Through the normal development process the OMNA entries or support registries should be accommodated. This should not be trigger to remove the linkage from this section. Thus, if an entry is added to OMNA after the initial Candidate version described the need - the material should stay in this section. It may be useful in subsequent releases to add some text to indicate that the needed items have been accommodated (e.g. add a comment regarding its availability or support as appropriate).

If the release has absolutely no OMNA items to be accommodated - then it should indicate that explicitly with a short description (e.g. this release does not have any OMNA items for handling). This determination probably can not be made until the end of the development phases and editors are encouraged to keep this advisory in place until the Consistency Review.

DELETE THIS COMMENT >>

## 7. Conformance Requirements Notation Details

This section is informative

The tables in following chapters use the following notation:

- Item:** Entry in this column **MUST** be a valid `ScrItem` according to [SCRRULES].
- Feature/Application:** Entry in this column **SHOULD** be a short descriptive label to the **Item** in question.
- Requirement:** Expression in the column **MUST** be a valid `TerminalExpression` according to [SCRRULES] and it **MUST** accurately reflect the architectural requirement of the **Item** in question.

## 8. ERDEF for SUPL 3.0 - Client Requirements

This section is normative.

Item	Feature / Application	Requirement
OMA-ERDEF-<<ENABLER>>-C-001-<<M/O>>	<<ENABLER>> Client	

**Table 2: ERDEF for SUPL 3.0 Client-side Requirements**

## 9. ERDEF for SUPL 3.0 - Server Requirements

This section is normative.

Item	Feature / Application	Requirement
OMA-ERDEF-<<ENABLER>>-S-001-<<M/O>>	<<ENABLER>> Server	

Table 3: ERDEF for SUPL 3.0 Server-side Requirements



## Appendix A. Change History (Informative)

### A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior 3.0 version

### A.2 Draft/Candidate Version 3.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-ERELED-SUPL-V3_0	03 Nov 2009	n/a	First draft
	11 Nov 2009	2.1, 3.3, 4	CR incorporated: OMA-LOC-2009-0300
	16 Nov 2009	5	Updated document list
	15 Dec 2009	4.2, 4.3	Implemented CR: OMA-LOC-2009-0319
	08 Jan 2010	All	Editorial Corrections: Removal of empty App B Updated to 2010 template Updated document list
Candidate Versions OMA-ERELED-SUPL-V3_0	26 Jan 2010	n/a	TP approved via R&A ref# OMA-TP-2010-0006- INP_SUPL_V3_0_RD_for_Candidate_Approval
Draft Versions OMA-ERELED-SUPL-V3_0	10 Sep 2010	5	Document list updated
	13 Sep 2010	2.1, 5	Normative references sorted in alphabetical order Document list updated before notification of the RD to TP
Candidate Versions OMA-ERELED-SUPL-V3_0	21 Sep 2010	n/a	Notified to TP: OMA-TP-2010-0418-INP_SUPL_V3_0_RD_for_Notification