



Enabler Release Definition for Secure User Plane Location (SUPL)

Candidate Version 3.0 – 16 Sep 2014

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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/)
- [RFC2119] “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997, [URL:http://www.ietf.org/rfc/rfc2119.txt](http://www.ietf.org/rfc/rfc2119.txt)
- [RLP 1.1] “Roaming Location Protocol”, Version 1.0, Open Mobile Alliance™, OMA-TS-RLP-V1_1 [URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [SCRRULES] “SCR Rules and Procedures”, Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures, [URL:http://www.openmobilealliance.org/](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/](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/](http://www.openmobilealliance.org/)
- [SUPL MO] “OMA Management Object for SUPL”, Version 3.0, Open Mobile Alliance™, OMA-TS-SUPL-MO-V3_0 [URL:http://www.openmobilealliance.org/](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/](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/](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/](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/](http://www.openmobilealliance.org/)
- [SUPL2.0_MO] “OMA SUPL Managed Object DDF, Version 2.0”. Open Mobile Alliance™. OMA-SUP-MO_SUPL-V2_0. [URL:http://www.openmobilealliance.org](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/](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

Enabler Release 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.

Minimum Functionality Description Description of the guaranteed features and functionality that will be enabled by implementing the minimum mandatory part of the Enabler Release.

3.3 Abbreviations

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

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

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

4. Release Version Overview

This document outlines the Enabler Release Definition for the SUPL Enabler and the respective conformance requirements for clients and servers.

SUPL V3.0 describes the protocol between a SUPL Enabled Terminal (SET) and SUPL Location Platform (SLP¹) and the protocol between SLC and SPC.

SUPL draws on support from RLP [RLP 1.1], 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 1.0 supports immediate fix positioning procedures for GSM, WCDMA/TD-SCDMA and CDMA networks. It supports terminal and network based positioning methods defined for GSM, WCDMA/TD-SCDMA and CDMA such as A-GPS, EOTD and Enhanced Cell Id.

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 and 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.

4.3 Version 3.0 Functionality

SUPL 3.0 adds the following new functions:

- Support for LPPE
- Generic SUPL Session
- 3rd Party Relative Location
- Security model for non-UICC devices using client certificates stored on the device
- Support for a D-SLP

4.3.1 User Plane Location Protocol (ULP)

The UserPlane Location Protocol (ULP) is a protocol-level instantiation of the Lp 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]

¹ The SLP consists of SLC and SPC.

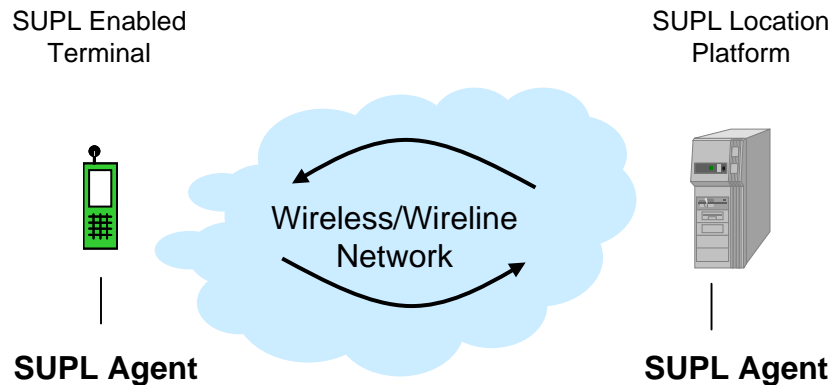


Figure 1: UserPlane Location Protocol

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 on whether the SUPL Agent residing in the network or the SUPL Agent residing in the SET requests service the SLP (Network Initiated) or the SET (SET Initiated) sends the service initiation message. ULP uses TCP/IP as transport with TLS providing for data integrity and data protection. The only exceptions are the service initiation messages SUPL INIT and SUPL REINIT which are generally transported over push mechanism (WAP Push, SIP Push, MT SMS, UDP).

4.3.2 Internal Location Protocol (ILP)

The Internal Location Protocol (ILP) is a protocol-level instantiation of the Llp reference point. The protocol is used between the SLC (SUPL Location Center) and a SPC (SUPL Positioning Center).

4.3.3 Roaming Location Protocol (RLP)

RLP is part of the OMA MLS Enabler, and enables SUPL roaming.

5. Document Listing for SUPL 3.0

This section is normative.

Doc Ref	Permanent Document Reference	Description
Requirement Document		
[SUPL3.0_RD]	OMA-RD-SUPL-V3_0-20110920-C	Requirement Document for SUPL 3.0 Enabler
Architecture Document		
[SUPL3.0_AD]	OMA-AD-SUPL-V3_0-20110920-C	Architecture Document for SUPL 3.0 Enabler
Technical Specifications		
[SUPL3.0_TS]	OMA-TS-ULP-V3_0-20140916-C	Specification that defines the SUPL 3.0 UserPlane Location Protocol.
[SUPL3.0_TS]	OMA-TS-ILP-V3_0-20140916-C	Specification that defines the SUPL 3.0 SPC-SLC Protocol.
[SUPL3.0_TS]	OMA-TS-SUPL_MO-V3_0-20140916-C	Specification that defines the SUPL 3.0 MO
Supporting Files		
[SUPL2.0_MO]	OMA-SUP-MO_oma_supl-v2_0-20120417-A	Device Description of the Management Object for SUPL 3.0. Working file in Management Object directory: file: oma_supl-v2_0.ddf path: http://www.openmobilealliance.org/Tech/omna/omna-dm_mo-registry.aspx
[SUPL3.0_MO]	OMA-SUP-MO_oma_sup-v3_0-20110920-C	Device Description of the Management Object for SUPL 3.0. Working file in Management Object directory: file: oma_supl-v3_0.ddf path: http://www.openmobilealliance.org/Tech/omna/omna-dm_mo-registry.aspx

Table 1: Listing of Documents in SUPL 3.0 Enabler

6. OMNA Considerations

The OMNA portal needs to add and maintain the following MO into OMNA Device Management (DM) Management Object (MO) Registry:

MO Identifier	Description	Owner	Version	MO DDF	MO Spec
urn:oma:mo:oma-supl:2.0	DDF Document for SUPL MO	OMA	V2.0	oma_supl-v2_0.ddf	OMA-TS-SUPL_MO-V2_0

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-SUPL-C-001	Support of SET Procedures	OMA-ERDEF-SUPL-C-002 OR OMA-ERDEF-SUPL-C-003 OR OMA-ERDEF-SUPL-C-004 OR OMA-ERDEF-SUPL-C-005 OR OMA-ERDEF-SUPL-C-006
Network and security types		
ULP-ERDEF-SUPL-C-002	Security function, GBA authentication model	ULP-PRO-C-046-O
ULP-ERDEF-SUPL-C-003	Security function, DCert authentication model	ULP-PRO-C-046-O
ULP-ERDEF-SUPL-C-004	Security function, ACA authentication model	ULP-PRO-C-045-O
ULP-ERDEF-SUPL-C-005	Security function, SLP-only authentication model	ULP-PRO-C-045-O
ULP-ERDEF-SUPL-C-006	Security function, SEK authentication model	ULP-PRO-C-046-O

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-SUPL-S-001	Support of ULP Procedures	OMA-ERDEF-SUPL-S-002 OR OMA-ERDEF-SUPL-S-003 OR OMA-ERDEF-SUPL-S-004 OR OMA-ERDEF-SUPL-S-005 OR OMA-ERDEF-SUPL-S-006 OR OMA-ERDEF-SUPL-S-007 OR OMA-ERDEF-SUPL-S-008
OMA-ERDEF-SUPL-S-002	Support of RLP	RLP 1.1: MCF
OMA-ERDEF-SUPL-S-003	Support of ILP	ILP 1.0 MCF
Network and security types		
ULP-ERDEF-SUPL-S-004	Security function, GBA authentication model	ULP-PRO-S-046-O
ULP-ERDEF-SUPL-S-005	Security function, DCert authentication model	ULP-PRO-S-046-O
ULP-ERDEF-SUPL-S-006	Security function, ACA authentication model	ULP-PRO-S-045-O
ULP-ERDEF-SUPL-S-007	Security function, SLP-only authentication model	ULP-PRO-S-045-O
ULP-ERDEF-SUPL-S-008	Security function, SEK authentication model	ULP-PRO-S-046-O

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 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 Version 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 Version OMA-ERELED-SUPL-V3_0	21 Sep 2010	n/a	Notified to TP: OMA-TP-2010-0418-INP_SUPL_V3_0_RD_for_Notification
Draft Versions OMA-ERELED-SUPL-V3_0	03 Jan 2011	5	Document list updated
	24 Feb 2011	5	Updated document listing
Candidate Version OMA-ERELED-SUPL-V3_0	08 Mar 2011	n/a	TP approved via R&A: OMA-TP-2011-0080-INP_SUPL_3.0_AD_for_Candidate_approval
Draft Versions OMA-ERELED-SUPL-V3_0	04 Jul 2011	5	Updated document listing
	22 Aug 2011	Throughout the document	Applied all changes assigned to the editor from OMA-CONRR-SUPL- V3_0-20110804-D
	08 Sep 2011	5	Updated document listing
Candidate Version OMA-ERELED-SUPL-V3_0	20 Sep 2011	All	TP approved via R&A: OMA-TP-2011-0332-INP_SUPL_3.0_ERP_for_Candidate_approval
Draft Versions OMA-ERELED-SUPL-V3_0	27 Sep 2012	2.1, 5, 6	Incorporated CR: OMA-LOC-2012-0195-CR_SUPL_3.0_ERELED_MOID_Downgrade Editorial changes
	21 Nov 2012	5	Updated document listing
	09 Sep 2014	5	Editorial update of permanent document references in section 5
Candidate Version OMA-ERELED-SUPL-V3_0	16 Sep 2014	All	Status changed to Candidate by TP TP Ref # OMA-TP-2014-0213- INP_SUPL_V3_0_ERP_for_Candidate_re_approval