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

Candidate Version 3.0 – 20 Sep 2011

**Open Mobile Alliance**
OMA-ERELD-SUPL-V3_0-20110920-C

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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/ |
| **[RFC2119]** | "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt |
| **[RLP 1.1]** | "Roaming Location Protocol ", Version 1.0, Open Mobile Alliance™, OMA-TS-RLP-V1_1 URL:http://www.openmobilealliance.org/ |
| **[SCRRULES]** | "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

| | |
|---|---|
| **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 |
| **ILP** | Internal Location Protocol |
| **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 |

| | |
|---|---|
| **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-SPC** | Visited SPC |
| **V-SLP** | Visited SLP |
| **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 (SLP[1]) 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 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]

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[1] The SLP consists of SLC and SPC.
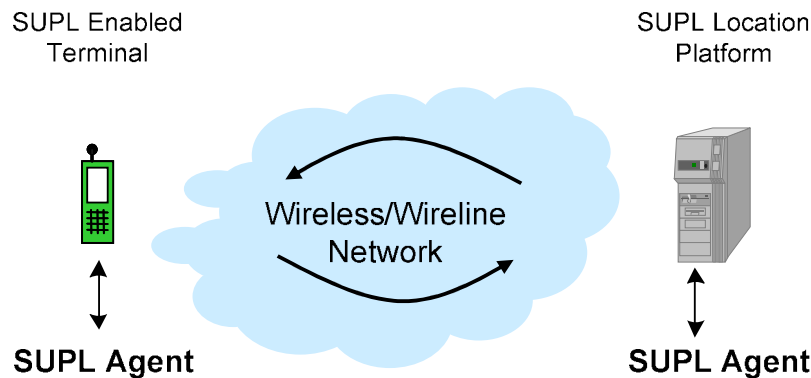
**Figure 1: UserPlane Location Protocol**

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_0-20110920-C | Specification that defines the SUPL 3.0 UserPlane Location Protocol. |
| [SUPL3.0_TS] | OMA-TS-ILP-V3_0-20110920-C | Specification that defines the SUPL 3.0 SPC-SLC Protocol. |
| [SUPL3.0_TS] | OMA-TS-SUPL_MO-V3_0-20110920-C | Specification that defines the SUPL 3.0 MO |
| **Supporting Files** | | |
| [SUPL3.0_MO] | OMA-SUP-MO_oma_sup-V3_0-20110920-C | Device Description of the Management Object for SUPL 3.0.<br><br>Working file in Management Object directory:<br>file:    oma_supl-v3_0.ddf<br>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

This release does not have any OMNA items for handling.

# 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 3.0 version |

## A.2     Draft/Candidate Version 3.0 History

| Document Identifier | Date | Sections | Description |
|---|---|---|---|
| Draft Versions<br>OMA-ERELD-SUPL-V3_0 | 03 Nov 2009 | n/a | First draft |
| | 11 Nov 2009 | 2.1, 3.3, 4 | CR incorporated:<br>OMA-LOC-2009-0300 |
| | 16 Nov 2009 | 5 | Updated document list |
| | 15 Dec 2009 | 4.2, 4.3 | Implemented CR:<br>OMA-LOC-2009-0319 |
| | 08 Jan 2010 | All | Editorial Corrections:<br>Removal of empty App B<br>Updated to 2010 template<br>Updated document list |
| Candidate Versions<br>OMA-ERELD-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<br>OMA-ERELD-SUPL-V3_0 | 10 Sep 2010 | 5 | Document list updated |
| | 13 Sep 2010 | 2.1, 5 | Normative references sorted in alphabetical order<br>Document list updatedbefore notification of the RD to TP |
| Candidate Versions<br>OMA-ERELD-SUPL-V3_0 | 21 Sep 2010 | n/a | Notified to TP:<br>OMA-TP-2010-0418-INP_SUPL_V3_0_RD_for_Notification |
| Draft Versions<br>OMA-ERELD-SUPL-V3_0 | 03 Jan 2011 | 5 | Document list updated |
| | 24  Feb 2011 | 5 | Updated document listing |
| Candidate Versions<br>OMA-ERELD-SUPL-V3_0 | 08 Mar 2011 | n/a | TP approved via R&A:<br>OMA-TP-2011-0080-INP_SUPL_3.0_AD_for_Candidate_approval |
| Draft Versions<br>OMA-ERELD-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 Versions<br>OMA-ERELD-SUPL-V3_0 | 20 Sep 2011 | All | TP approved via R&A:<br>OMA-TP-2011-0332-INP_SUPL_3.0_ERP_for_Candidate_approval |