Secure User Plane Requirements

Candidate Version 2.1 – 29 May 2012

Open Mobile Alliance

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Contents

Tables

1. Scope (Informative)

This document describes the requirements of the Secure User Plane for Location (SUPL).

2. References

2.1 Normative References

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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.

3.2 Definitions

Application Service Provider	A provider of software applications that interface with a SUPL server.
Cell Global Identifier	Refers to the cell used by the Mobile Station at the start of the call. (See [23.271]).
Change of Area	A change of area reflects when a SET crosses a geographic area. The SET may be crossing into or out of an area.
Control Plane	The Control Plane is a functional plane containing the signalling structure for the user bearer management. Typically the control plane designates the circuit switched and packet switched wireless signalling networks which enable voice, data, supplementary service operation, etc.
GMLC	The Gateway Mobile Location Center (GMLC) contains functionality required to support LCS. In one PLMN, there may be more than one GMLC (See [23.271]).
GNSS	A Global Navigation Satellite System (GNSS) is a network of satellites that broadcasts navigation signals including time and distance data. GNSS receivers pick up these signals and calculate their precise location anywhere around the globe. Examples of GNSS include Global Positioning System (GPS), GALILEO, etc.,.
I-WLAN	The interworking WLAN refers to the system for interworking between GSM/UMTS/LTE or CDMA systems and WLAN. The intent of GSM/UMTS/LTE or CDMA –WLAN Interworking is to extend GSM/UMTS/LTE or CDMA services and functionality to the WLAN access environment. The GSM/UMTS/LTE or CDMA –WLAN Interworking System provides bearer services allowing a GSM/UMTS/LTE or CDMA subscriber to use a WLAN to access GSM/UMTS/LTE or CDMA PS based services.
I-WiMAX	The interworking WiMAX (I-WiMAX) refers to the system for interworking between 3GPP/3GPP2 systems and WiMAX. The intent of 3GPP/3GPP2–WiMAX Interworking is to extend 3GPP/3GPP2 services and functionality to the WiMAX access environment. The 3GPP/3GPP2–WiMAX Interworking System provides bearer services allowing a 3GPP/3GPP2 subscriber to use a WiMAX to access 3GPP/3GPP2 PS based services.
LCS	Provides the mechanisms to support mobile location services for operators, subscribers and third party service providers (See [23.271]).
Lg	Interface between Gateway MLC - VMSC, GMLC - MSC Server, GMLC - SGSN (gateway MLC interface) (See [23.271]).
Location Server	Software and/or hardware entity offering location capabilities.
Lr	Interface between Gateway MLCs (See [23.271]).
MLS application	An application which requests and consumes the location information. Note: this could be further qualified by distinguishing the application provider and actually application consumer of the location information
MLS application and SUPL Agent classes	MLS Application and SUPL Agent can be classified as follows: - Class1: MLS application and SUPL Agent are in the SET - Class 2: MLS application is in the network and the SUPL Agent is in the SET - Class 3: MLS application is in the SET and SUPL Agent is in the network - Class 4: MLS application and the SUPL Agent are in the network

Network specific parameter	Parameters, extracted from the mobile network, which can be used in a Position Calculation function.
Periodic Location Service	Location service where a multiple periodic location information is needed.
Policy Owner	The privacy policy owner of the SET. Defines/configures the privacy rules to which the MLS applications will comply to.
Quality of Position	A set of attributes associated with a request for the geographic position of a SET. The attributes include the required horizontal accuracy, vertical accuracy, maximum location age, and response time of the SET position.
Security Function	Security function manages the Authentication and Authorization for SUPL Agents and MLS Applications to access User Plane Location Services Note: Authentication between the SUPL Agent and MLS applications is beyond the scope of this work
SET user	User of the SET, the SET user MAY differ from the Policy owner.
SUPL Agent	Service access point which accesses the network resources to obtain location information
SUPL Agent classes	Classifies the deployment architecture of SUPL Agent and MLS application.
SUPL Enabled Terminal (SET)	A logical entity in 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 CDMA, or a PC over an IP-based transport
SUPL Location Platform (SLP)	Entity responsible for SUPL Service Management and Position Determination.
SUPL Network	Access network which facilitates the Location determination functionality and provides the SUPL bearer.
SUPL Provider	Location information is sensitive personal information and requires specific care with privacy and security. The bearer related information (like e.g. "Global Cell Identifier") should not be accessible without the network provider's consent. So it is important that whatever policy the network provider decides, when applicable on the provision of SUPL, functionality cannot be breached. Valid scenarios would be: 1) The network provider is the single SUPL provider 2) The network provider and roaming partners are the only SUPL providers. 3) The network provider out-sources the SUPL functionality and there is a single 3rd party SUPL provider. 4) The network provider has an open policy on the provision of SUPL functionality and there are multiple 3rd party SUPL providers.
SUPL User	The user of a MLS application
Target SET	The SET that is being located as part of a SUPL session.
Third Party	A third party is an entity that receives the location information of a target SET from the location server (e.g. GMLC, MPC or SLP).
Timing Advance	Parameter in GSM network indicating distance between Base Station and terminal.
Triggered Location Request	A location request that is initiated due to either a periodic time event or a change of area event.
User Plane	The user plane designates the functional plane where the information is part of the wireless user data and is transported over user bearers such as the wireless packet data network or SMS.
WLAN	A local area network that provides wireless access via IEEE [IEEE 802.11].

3.3 Abbreviations

3GPP	3rd Generation Partnership Project (3GPP)
3GPP2	3rd Generation Partnership Project 2 (3GPP2)
AFLT	Advanced Forward Link Trilateration

A-GNSS	Assisted Global Navigation Satellite System
A-GPS	Assisted Global Positioning System
API	Application Programming Interface
CDMA	Code Division Multiple Access
CGI	Cell Global Identifier
DoS	Denial of Service
D-SLP	Discovered SLP
DTD	Document Type Definition
E-CI	Enhanced Cell-ID
EOTD	Enhanced Observed Time Difference
GMLC	Gateway Mobile Location Center (see [23.271])
GMT	Greenwich Mean Time
GNSS	Global Navigation Satellite System
GPRS	General Packet Radio Service
GPS	Global Positioning System
GSM	Global Systems for Mobile Communications
HPLMN	Home Public Land Mobile Network (See [23.271])
HRPD	High Rate Packet Data
H-SLP	Home SLP
HTTP	Hypertext Transfer Protocol
HTTPS	HTTP Secure
I-WLAN	Interworking WLAN
I-WiMAX	Interworking WiMAX
LAN	Local area network
LCS	Location Services
LTE	Long Term Evolution
MLC	Mobile Location Center
MLP	Mobile Location Protocol
MLS	Mobile Location Services
MS	Mobile Station
OMA	Open Mobile Alliance
OTDOA	Observed Time Difference of Arrival
P2M	Point-to-Multipoint
P2P	Point-to-Point
PS	Packet switched services
QoP	Quality of Position
RD	Requirement Document
SET	SUPL Enabled Terminal
SLP	SUPL Location Platform
SMS	Short Message Service

SUPL	Secure User Plane Location
TD-SCDMA	Time Division-Synchronous Code Division Multiple Access
UE	User Equipment
UMB	Ultra Mobile Broadband
UMTS	Universal Mobile Telecommunications Service
WCDMA	Wideband Code Division Multiple Access
WiMAX	Worldwide Interoperability for Microwave Access Forum

4. Introduction (Informative)

Location services based on the location of mobile devices are becoming increasingly widespread. SUPL (Secure User Plane Location) employs user plane data bearers for transferring location assistance information such as GPS assistance data, and for carrying positioning technology-related protocols between mobile terminal and the network. SUPL is intended as an alternative and complement to the existing standards based on signalling in the mobile network control plane.

SUPL assumes that the mobile network or other access network is capable of establishing a data bearer connection between terminal and location server.

SUPL utilises existing standards where available and possible, and SUPL should be extensible to enabling more positioning technologies as the need arises so that they utilise the same mechanism. In the initial phase, SUPL provided full functionality of A-GPS with minimum changes of current network elements. From SUPL Release 2, A-GNSS concept was introduced to allow all possible Navigation Satellite System assisted positioning technology be utilized, e.g. GPS, GALILEO, and so on.

Note: Applicability of a particular A-GNSS is subject to the support in relevant 3GPP and 3GPP2 specifications that SUPL is reliant on.

This SUPL RD describes the high-level functional requirements for SUPL including SUPL-specific security, interoperability, and privacy.

SUPL is not an application interface protocol. It does not expose an API to LCS applications. Other OMA specifications such as MLP are designed for that function. Hence, any reference to an MLS application in this document, is assumed to request location information via a specification such as MLP.

5. SUPL 2.1 release description (Informative)

The goal of the SUPL Enabler Release V2.1 is to back port the SUPL 3.0 Discovered SLP (D-SLP) feature to SUPL 2.0. This feature is an important feature for the SUPL community. This enabler allows the feature to be available prior to general availability of SUPL 3.0 handsets.

5.1 Version 1.0

The objective of SUPL 1.0 is to enable an industry standard framework for positioning over the User Plane.

User Plane is bearer independent and intended to work on a number of different bearers in cellular and WLAN/Internet environments. It is intended that this mechanism could be implemented in a wide range of contexts (e.g., a controlled mobile network operator's environment or an open Internet/WLAN environment).

User plane solutions are not intended to replace control plane solutions but to provide an alternative.

The design aims for this framework are to provide a well-defined mechanism, which may have the following characteristics but not restricted or committed to:

CHARACTERISTICS	Examples
Bearer Independence	GSM/WCDMA/CDMA
Location Technology Independence	A-GPS or Cell-ID(as in example below)
Standardised message flows for Mobile originated and mobile terminated fixes	Fix calculation initiated by an action on the terminal or by an action on another entity
Positioning Methods - Mobile based or mobile assisted fixes	Send measurements/assistance data to/from terminal, calculate on the terminal or on a server
Message wrappers for existing Control Plane solutions	3GPP RRLP, RRC, 3GPP2 IS801 A-GPS messages
Message extension mechanisms to supplement defined payloads	Add implementation specific information elements as required
Mechanisms to enable an implementation to comply with the Supplier's business rules	For an implementation, which entities can initiate a fix, supply assistance data, obtain fix information
Mechanisms to enforce Privacy Requirements determined by applicable Standards, local Regulations, applicable International Regulations and either the Subscriber or the End User preferences dependent on the business rules implemented	Subscriber preferences, 3GPP defined Subscriber Privacy Profile Register, 3GPP defined interactions on the mobile, 3GPP2 location information restrictions, EC regulations

5.2 Version 2.0

This version adds new functionality, and based on experience with SUPL 1.0, enhances the existing functionality while maintaining the SUPL 1.0 requirements.

The new functionality includes triggered services (e.g., periodic and change of area), and network environments (e.g., I-WLAN). In addition, SUPL 2.0 addresses emergency services.

While SUPL 1.0 is restricted to facilitate the location process of a specific SET, SUPL 2.0 introduces new functionality for a SET, provided by the SUPL Location Platform (SLP):

- To request the location of a target terminal

- To send its location to a third party

SUPL 1.0 currently utilises a number of bearer and transport technologies. Adapting the architecture to other network technologies like I-WLAN provides the same level of service to these environments. Other alternative (wireless) bearer and transport technologies are also considered.

This release also enhances existing functionality including but not limited to positioning method, privacy, and security.

6. Requirements (Normative)

The requirements in this section define the full SUPL Enabler.

6.1 High-Level Functional Requirements

Label	Description	Release
HLFR-01	SUPL SHALL support positioning procedures performed in collaboration with the target SET and a network resident SUPL function.	SUPL V1.0
HLFR-02	SUPL SHALL support Network-initiated location requests. Network-initiated locating use cases SHALL support P2P (point-to-point) connections and they, if technically feasible, MAY support P2M (point-to-multipoint) connections for emergency. For example, a P2M (point-to-multiple) connection which broadcasts to multiple devices/users is useful for emergency services, especially in a building or hot spot area.	SUPL V1.0
HLFR-03	SUPL SHALL support SET-initiated location requests.	SUPL V1.0
HLFR-04	Immediate location requests SHALL be supported.	SUPL V1.0
HLFR-05	Location information is the result of a successful SUPL location transaction, and SHALL at a minimum, consist of latitude, longitude and timestamp (time at which location estimate is made) but can contain other information, including shape, uncertainty, altitude, speed, direction, QoP, etc.	SUPL V1.0
HLFR-06	A SUPL Agent SHALL be able to specify the desired QoP, including but not limited to accuracy, response time and age of location, in requesting the location of a SET.	SUPL V1.0
HLFR-07	Where multiple transmission methods are available in a network, and the primary transmission method fails or is not available (e.g., GPRS in a voice call with a class B handset) then it SHALL be possible to use an alternative bearer to successfully perform a full session that has been interrupted by the primary transmission method becoming unavailable.	SUPL V1.0
HLFR-08	The SUPL architecture and protocol specification SHOULD not be the limiting factor in the location reporting interval from the SUPL system. E.g., for an underlying Location Technology and Bearer Technology combination that provides a 10 second reporting interval, SUPL should not degrade this reporting interval.	SUPL V2.0
HLFR-09 Triggered Location Requests	Triggered location requests SHALL be supported. Triggered location requests are requests, which require event-based location reporting, or location reporting triggered by some other condition.	SUPL V2.0
HLFR-10 Priority	It SHALL be possible to differentiate between the priorities of different location requests. E.g., it may be necessary to differentiate emergency service requests from commercial services.	SUPL V2.0
HLFR-11	SUPL SHALL support SET-initiated location request for the transfer of the SET's position information to a third party.	SUPL V2.0
HLFR-12	SUPL SHALL support SET-initiated location request to obtain the location of another Target SET	SUPL V2.0
HLFR-13	SUPL SHALL support SLP service discovery.	SUPL V2.1

Table 1: High-Level Functional Requirements

6.1.1 Security

Label	Description	Release
SEC-01	SUPL SHALL ensure that any location information that is stored or exchanged is secure and thus is not accessible to unauthorized access, i.e., unauthorized disclosure, usage, loss or corruption of location data is prevented. - If SUPL provides the ability for the SET or SUPL network to store location information, the location data SHALL be stored in a secure manner and SHALL be available for retrieval by authorized applications. - Note that the authorization here is governed by the Policy owner privacy requirements (i.e., user privacy preferences/profile) and local regulations. Stored location data SHALL only be accessible to those applications that are authorized by the Policy owner. - Emergency services and lawful purposes are exempted from this requirement in that they can override any user privacy preference setting.	SUPL V1.0
SEC-02	SUPL SHALL deliver its content (data which facilitates the SUPL transaction) in a trustworthy and reliable manner, e.g., Location information SHALL be protected against eavesdropping or modification of the data traffic.	SUPL V1.0
SEC-03	It SHALL be possible to authenticate the SUPL Agent, SUPL network and SET user.	SUPL V1.0
SEC-04	SUPL 2.0 specifications SHOULD provide mechanisms to prevent Denial of Service (DoS) attacks	SUPL V2.0

Table 2: High-Level Functional Requirements – Security Items

6.1.1.1 Authentication

None identified.

6.1.1.2 Authorization

None identified.

6.1.1.3 Data Integrity

None identified.

6.1.1.4 Confidentiality

None identified.

6.1.2 Charging Events

Label	Description	Release
CRG-01	SUPL SHALL support the ability for the SUPL provider to apply different charging schemes depending on the service provided. Note that the cost of SUPL to a SET user may be a QoP parameter, which is negotiated between the SET user application and the SUPL Provider	SUPL V1.0
CRG-02	SUPL SHALL record the appropriate information to enable charging schemes, including but not limited to: SET identity, QoP requested, QoP provided, timestamp.	SUPL V1.0

Table 3: High-Level Functional Requirements – Charging Events Items

6.1.3 Administration and Configuration

Label	Description	Release
ADMC-01	The architecture SHALL enable SUPL service management and location information control in both the SET and the network, depending on the SUPL Provider's requirements.	SUPL V1.0
ADMC-02	Where the SUPL provider supports the use case to supply the SET with assistance data only, the SET SHALL control the location information.	SUPL V1.0

Table 4: High-Level Functional Requirements – Administration and Configuration Items

6.1.4 Usability

Label	Description	Release
USAB-01	As SUPL is time-sensitive, all SUPL events and transactions SHALL be time-stamped and SHALL use the most recent up-to-date data available (High Data Quality). The content of the service SHALL be based on up-to-date data. Consistency and coherency are other important factors.	SUPL V1.0
USAB-02	SUPL SHALL be available for value-added commercial applications as well as for emergency service applications within the technical limitations of each access network (Service Support). Additionally, the SUPL architecture SHALL be able to differentiate between emergency services and commercial services. Note 1: In some networks it is not possible to support simultaneous voice and data communication, Hence if simultaneous communication is not supported, SUPL will not be available during voice communication.	SUPL V2.0

Table 5: High-Level Functional Requirements – Usability Items

6.1.5 Interoperability

Label	Description	Release
IOP-01	The SUPL reference architecture SHALL allow co-existence with existing location related standards specified by 3GPP2, 3GPP and IEEE, i.e., the SUPL architecture SHALL NOT negatively impact the operation and performance of existing standards in any way.	SUPL V2.0
IOP-02	SUPL SHALL support the positioning of roaming SET users. This will include roaming in the context of the bearer utilised for the secure user plane, the SET user, the MLS application and both the SET user and the MLS application. SUPL SHALL support SET roaming between a network which adopts SUPL and a network which adopts existing LCS standards (e.g., [X.S0002], [23.271]). The SUPL architecture needs to work within the framework of these roaming standards and provide support where gaps specific to SUPL are identified. If the roaming network does not have location capability such as A-GPS, alternative solutions MAY be applied. In order to provide seamless QoP to a SET user, it SHALL be possible for SET user roaming in a network which does not support A-GPS to be served by a SUPL provider via its home network.	SUPL V1.0
IOP-03	The SUPL architecture SHALL provide backward compatibility mechanisms (e.g., protocol versioning).	SUPL V1.0
IOP-04	The architecture SHALL support the ability for a SET to provide its SUPL specific capabilities to the SUPL network.	SUPL V1.0
IOP-05	The architecture SHALL support the ability for a SUPL provider to provide its SUPL specific capabilities to the SET.	SUPL V1.0

IOP-06	SUPL SHALL provide the capability to negotiate between SUPL elements such that the SUPL session MAY fallback to an earlier version, if such fallback is allowed by the SUPL Provider and if the requested service is available in the earlier version.	SUPL V2.0
IOP-07	SUPL SHALL support the ability to negotiate positioning protocols versions	SUPL V2.0
IOP-08	The SUPL 2.1 architecture SHALL be compatible with the SUPL 3.0 architecture.	SUPL V2.1

Table 6: High-Level Functional Requirements – Interoperability Items

6.1.6 Privacy

Label	Description	Release
PRIV-01	SUPL SHALL ensure that the end-user's privacy is protected in all transactions consistent with the user's privacy preferences, except for emergency or lawful purposes depending on local/regional regulations. Note that multiple layers of privacy protection MAY be provided.	SUPL V1.0
PRIV-02	SUPL SHALL support a general and synchronised privacy framework. Note that MLS application, SUPL Agent, SUPL network and SET can be part of several domains: Mobile Network Operator, IT domain or device domain. Therefore, several service architectures can be derived from these three domains. As the MLS application, SUPL Agent, SUPL network and SET can be part of the above-mentioned domains, the same level of privacy management SHALL be performed for all service architectures.	SUPL V1.0
PRIV-03	SUPL SHALL support privacy check after positioning if the Policy owner has defined different privacy settings for different geographical locations.	SUPL V2.0
PRIV-04	SUPL SHALL support the notification and verification conditional on the current location of the SET of SUPL user. In this case the notification and, if defined in the SUPL user's privacy settings, verification SHALL be performed after the target SET is positioned but before reporting the location of target SET to MLS Client.	SUPL V2.0

Table 7: High-Level Functional Requirements – Privacy Items

6.1.7 Location Technology

Label	Description	Enabler Release
LOCT-01	The architecture SHALL support Cell ID positioning. Deployment of each technology option is a SUPL provider decision. However, in a Mobile Network, Cell ID SHALL always be the backup positioning method when other positioning methods fail.	SUPL V1.0
LOCT-02	The architecture SHALL support Enhanced Cell ID positioning. Enhanced Cell-ID (E-CI) positioning is defined as enhancing Cell ID positioning by using additional measurements from the Mobile Network that are available in the SET.	SUPL V1.0
LOCT-03	The architecture SHALL support A-GPS positioning.	SUPL V1.0
LOCT-04	The architecture SHALL support standalone-positioning technologies, e.g., autonomous GNSS.	SUPL V2.0
LOCT-05	The architecture SHALL support EOTD positioning if EOTD measurements are available.	SUPL V1.0
LOCT-06	The architecture SHALL support OTDOA positioning if OTDOA measurements are available.	SUPL V1.0
LOCT-07	The architecture SHALL support AFLT positioning if AFLT measurements are available.	SUPL V1.0
LOCT-08	The architecture SHALL support the delivery of assistance data from the SUPL network to the SET.	SUPL V1.0

LOCT-09	SUPL architecture SHALL support an extensible framework so that new location technologies, supported by the network, can be added efficiently and in-line with the overall architecture.	SUPL V1.0
LOCT-10	The architecture SHALL support A-GNSS positioning according to 3GPP and 3GPP2 specifications.	SUPL V2.0

Table 8: High-Level Functional Requirements – Location Technology Items

6.1.8 Emergency Services

Label	Description	Enabler Release
EMER-01	SUPL SHALL allow support for location requests associated with emergency services where applicable by local regulatory requirements.	SUPL V2.0
EMER-02	It SHALL be possible for emergency services location requests to have a higher priority than other location requests based on local regulatory requirements.	SUPL V2.0

Table 9: High-Level Functional Requirements – Emergency Services Items

6.1.9 Triggered Location Requests

Label	Description	Enabler Release
TRIG-01	SUPL SHALL support the periodic trigger of the triggered location request.	SUPL V2.0
TRIG-02	SUPL SHALL support the area event trigger of the triggered location request. The area event is the event where the SET enters, leaves, is inside, or is outside a pre-defined geographical area.	SUPL V2.0

Table 10: High-Level Functional Requirements – Triggered Location Requests Items

6.2 Overall System Requirements

Label	Description	Release
OSR-01	The SUPL reference architecture and specifications SHALL be compatible with all underlying network technologies (Data Bearer Independence). For example, air interface standards (GSM, WCDMA/TD-SCDMA, LTE, CDMA, HRPD, UMB, WLAN, WiMAX) and transport media (packet data services, SMS, etc) MUST be supported.	SUPL V2.0
OSR-02	SUPL SHALL NOT impose any requirements on the underlying data bearer service. Hence it MUST NOT be necessary to modify the architecture or functionality in underlying network technology.	SUPL V1.0
OSR-03	The SUPL reference architecture will introduce new logical functions. It MUST be possible for these functions to be either hosted in existing LCS elements (for example the GMLC) or in completely new physical entities.	SUPL V1.0
OSR-04	The architecture SHALL support storage of location information for a SET user in order to provide it at a later time.	SUPL V1.0
OSR-05	SUPL SHALL be made adaptable to different legislative environments and variable security requirements so that it is legal to deploy and use SUPL, enabling applications utilizing location information under the laws of different countries.	SUPL V1.0
OSR-06	SUPL SHALL NOT prevent the Application Service Provider from choosing a SUPL provider.	SUPL V1.0
OSR-07	SUPL SHALL support the positioning of a SET attached to a WLAN network.	Future
OSR-08	SUPL SHALL support the positioning of a SET attached to an I-WLAN network.	SUPL V2.0
OSR-09	SUPL SHALL support the positioning of a SET attached to a WiMAX network.	SUPL V2.0

OSR-10	SUPL SHALL support the positioning of a SET attached to an I-WiMAX network.	SUPL V2.0

Table 11: High-Level System 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 2.1 History

Document Identifier	Date	Sections	Description
Draft version OMA-RD-SUPL-V1_2	08 Nov 2011	n/a	First draft
Draft versions OMA-RD-SUPL-V2_1	26 Mar 2012	4, 5.1, Appendix B	OMA-LOC-2012-0051R01-CR_SUPL_2_1_Formal_Review_Comment_Updates
	30 Apr 2012	n/a	Editorial changes
Candidate version OMA-RD-SUPL-V2_1	29 May 2012	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2012-0206-INP_SUPL_21_RD_and_AD_for_Candidate_Approval

Appendix B. Use Cases (Informative)

B.1 Use Case: SET originated Discovered SLP (D-SLP) Scenario

B.1.1 Short Description

Capability: The SET is to be provided a list of D-SLP's it may use for future location requests. The mechanism how the H-SLP determines this is outside the scope of the RD.

B.1.2 Actors

SUPL Enabled Terminal (SET)

SUPL Provider acting as Home SLP (H-SLP)

SUPL Provider acting as a Discovered SLP (D-SLP)

B.1.2.1 Actor Specific Issues

The requesting SET supports interface to both an H-SLP and D-SLP.

B.1.2.2 Actor Specific Benefit

The requesting SET can benefit from a D-SLP's additional assistance data or the D-SLP's ability to calculate a more precise position than an H-SLP.

B.1.3 Pre-conditions

SUPL User is authorised to make the SET originated location request.

The SET is within the coverage area of a D-SLP.

The H-SLP is provisioned and enabled to provide a D-SLP address to the requesting SET.

B.1.4 Post-conditions

The requesting SET successfully obtains a location from the D-SLP.

B.1.5 Normal Flow

1. A SUPL User subscribes to a SET resident MLS application, which has access to the SUPL agent on the SET.
2. The SUPL agent on the SET requests the location from the network (H-SLP).
3. The H-SLP calculates the location of the SET.
4. The location information is returned to the requesting SET SUPL agent by the H-SLP.
5. The H-SLP returns a valid FQDN for a Discovered SLP (D-SLP) to the SET SUPL agent.
6. The SET SUPL agent forwards the location result to the SET resident MLS application.
7. The SUPL agent on the SET requests the location from the network (D-SLP).
8. The D-SLP resolves the location of the SET.
9. The location information is returned to the requesting SET SUPL agent by the D-SLP.
10. The SET SUPL agent forwards the location result to the SET resident MLS application.

B.1.6 Alternative Flow

The SET is outside the coverage of any D-SLP.

1. A SUPL User subscribes to a SET resident MLS application, which has access to the SUPL agent on the SET.
2. The SUPL agent on the SET requests the location from the network (H-SLP).
3. The H-SLP resolves the location of the SET.
4. The location information is returned to the requesting SET SUPL agent by the H-SLP.
5. The SET SUPL agent forwards the location result to the SET resident MLS application.

B.1.7 Operational and Quality of Experience Requirements

N/A.