SUPL Configuration Services

Approved Version 1.0 – 18 Mar 2014

Open Mobile Alliance

OMA-RR-SUPL_Configuration_Services-V1_0-20140318-A

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1. Scope

This document is a combined document that includes requirements, architecture and the technical specification of the SUPL Configuration Services (SUPLCS) reference release.

The purpose of the SUPL Configuration Services 1.0 reference release is to provide a mobile operator the ability to host a SUPL configuration and provisioning service that SUPL devices may query to obtain SUPL configuration information.

The configuration information may include but not be limited to:

- An H-SLP for a mobile operator.
- Multiple E-SLPs for a mobile operator.
- Multiple D-SLPs for a mobile operator.
- An H-SLP to utilize for an individual application.

This configuration mechanism is needed to allow the mobile operator the most flexibility when building their mobile LBS platforms.

This document will define the methods for obtaining SUPL configuration data from a mobile operator. The architecture for transferring the configuration data will be implemented using the OMA Device Management [OMA DM] enabler.

2. References

2.1 Normative References

[OMA-DM-StdObj] "OMA Device Management Standardized Objects", Version 2.0, Open Mobile Alliance™, OMA-TS-DM_StdObj-V2_0-20100609-D

[OMA-DM-V1_2_1] "Device Management", Version 1.2.1, Open Mobile Alliance™, OMA-ERP-DM-V1_2_1, URL:http://www.openmobilealliance.org/

[OMA-DM-V1_3] "Device Management", Version 1.3, Open Mobile Alliance™, OMA-ERP-DM-V1_3, URL:http://www.openmobilealliance.org/

[OMA-DM-V2_0)] "Device Management", Version 2.0, Open Mobile Alliance™, OMA-ERP-DM-V2_0, URL:http://www.openmobilealliance.org/

[OMA-SUPL-V1_0] "Secure User Plane Location", Version 1.0, Open Mobile Alliance™, OMA-ERP-SUPL-V1_0, URL:http://www.openmobilealliance.org/

[OMA-SUPL-V2_0] "Secure User Plane Location", Version 2.0, Open Mobile Alliance™, OMA-ERP-SUPL-V2_0, URL:http://www.openmobilealliance.org/

[OMA-SUPL-V2_0_1] "Secure User Plane Location", Version 2.0.1, Open Mobile Alliance™, OMA-ERP-SUPL-V2_0_1, URL:http://www.openmobilealliance.org/

[OMA-SUPL-V2_1] "Secure User Plane Location", Version 2.1, Open Mobile Alliance™, OMA-ERP-SUPL-V2_1, URL:http://www.openmobilealliance.org/

[OMA-SUPL-V3_0] "Secure User Plane Location", Version 3.0, Open Mobile Alliance™, OMA-ERP-SUPL-V3_0, URL:http://www.openmobilealliance.org/

[OSE] "OMA Service Environment", Open Mobile Alliance™, 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

[RFC4234] "Augmented BNF for Syntax Specifications: ABNF". D. Crocker, Ed., P. Overell. October 2005, URL:http://www.ietf.org/rfc/rfc4234.txt

[SCRRULES] "SCR Rules and Procedures", Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures, URL:http://www.openmobilealliance.org/

[SUPL MO] "OMA Management Object for SUPL", Version 2.0, Open MobileAlliance™, OMA-TS-SUPL-MO-V2_0, URL:http//www.openmobilealliance.org/

2.2 Informative References

[OMA DM] This reference will be used when referring to OMA DM content that is not release specific. See Normative References for OMA DM specific references.

[OMADICT] "Dictionary for OMA Specifications", Version x.y, Open Mobile Alliance™, OMA-ORG-Dictionary-Vx_y, URL:http://www.openmobilealliance.org/

[SUPL] This reference will be used when referring to OMA SUPL content that is not release specific. See Normative References for OMA SUPL specific references.

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

SUPL Configuration Services	The SUPL Configuration Services [SUPL CS] reference release allows a mobile operator to define and configure multiple SLPs to be enabled for their subscriber’s handsets to utilize.
SUPL Roaming	For positioning not associated with an emergency services call, SUPL roaming occurs when a SET leaves the service area of its H-SLP. The service area of an H-SLP or E-SLP includes the area within which the H-SLP or E-SLP can provide a position estimate for a SET or relevant assistance data to a SET without contacting other SLPs. It should be noted that an H-SLP or E-SLP service area is not necessarily associated with the service area(s) of the underlying wireless network(s).

3.3 Abbreviations

DM	OMA Device Management
D-SLP	Discovered SLP
E-SLP	Emergency SLP
FQDN	Fully Qualified Domain Name
H-SLP	Home SLP
OMA	Open Mobile Alliance
OMNA	Open Mobile Naming Authority
SET	SUPL Enabled Terminal
SLP	SUPL Location Platform
SUPL	Secure User Plane Location
SUPLCS	SUPL Configuration Services

4. Introduction

The SUPL Configuration Services (SUPLCS) reference release allows an operator to maximize the configuration of SLPs to be utilized in their environment. Multiple SLPs are desirable to maximize revenue and minimize expenses for the mobile operator. SUPLCS will be architected to be independent of the SUPL releases defined in OMA. This approach will enable SUPL to continue on its track and the SUPLCS can evolve independently. A mobile operator may choose to not even utilize this reference release. The use cases are developed so the mobile operator can choose the features defined in this reference release.

4.1 Version 1.0

The version 1.0 of the SUPL Configuration Services (SUPLCS) will enable a mobile operator to configure multiple SLPs to be utilized for SUPL services. The goal for version 1.0 is to enable SLPs to be configured for all of the SLP deployment models described in the SUPL releases (**[OMA-SUPL-V1_0], [OMA-SUPL-V2_0], [OMA-SUPL-V2_0_1], [OMA-SUPL-V2_1] and [OMA-SUPL-V3_0]**).

The SUPLCS defines configuration information that may include but not be limited to:

- An H-SLP for a mobile operator.
- Multiple E-SLPs for a mobile operator.
- Multiple D-SLPs for a mobile operator.
- An H-SLP to utilize for an individual application.

5. Requirements (Normative)

The requirements in this section define the full SUPL Configuration Services reference release.

5.1 High-Level Functional Requirements

Label	Description	Release
SUPLCS-HLF-01	SUPLCS SHALL support configuring a default H-SLP for a mobile operator.	SUPLCS V1.0
SUPLCS-HLF-02	SUPLCS SHALL support configuring one or more E-SLPs for the default H-SLP.	SUPLCS V1.0
SUPLCS-HLF-03	SUPLCS SHALL support configuring one or more D-SLPs for the H-SLP.	SUPLCS V1.0
SUPLCS-HLF-04	Configuration information for an SLP SHALL be consistent with SLP information defined in existing versions of SUPL in order to avoid new impacts to SUPL. This means the following: 1. for an H-SLP, configuration information SHALL be limited to the H-SLP address; 2. for a D-SLP, configuration information SHALL be the same as or a subset of D-SLP information provided by an H-SLP in SUPL 2.1; 3. for an E-SLP, configuration information SHALL be limited to the E-SLP address.	SUPLCS V1.0
SUPLCS-HLF-05	SUPL CS SHALL support configuration of multiple H-SLPs which may be accessed on a per application basis.	SUPLCS V1.0
SUPLCS-HLF-06	An application SHALL be permitted to access only one configured H-SLP.	SUPLCS V1.0

5.2 Security

Label	Description	Release
SUPLCS-SEC-01	SUPLCS SHALL utilize the security mechanisms defined in [OMA DM].	SUPLCS V1.0

5.3 Authentication

Label	Description	Release
SUPLCS-AUT-01	SUPLCS SHALL utilize the authentication mechanisms defined in [OMA DM].	SUPLCS V1.0

5.4 Authorization

Label	Description	Release
SUPLCS-AUTH-01	SUPLCS SHALL utilize the authorization mechanisms defined in [OMA DM].	SUPLCS V1.0

5.5 Data Integrity

Label	Description	Release
SUPLCS-DI-01	Management Objects defined for SUPLCS SHALL be valid based on the schema definitions for [OMA DM].	SUPLCS V1.0

5.6 Confidentiality

None identified.

5.7 Charging

None identified.

5.8 Administration and Configuration

Label	Description	Release
SUPLCS-ADMC-01	SUPLCS SHALL utilize the administration and configuration mechanisms defined in [OMA DM].	SUPLCS V1.0

5.9 Usability

None identified.

5.10 Interoperability

Label	Description	Release
SUPLCS-IOP-01	SUPLCS SHALL be independent of the [OMA DM] release.	SUPLCS V1.0
SUPLCS-IOP-02	SUPLCS SHALL be independent of the [SUPL] release with the following restrictions: 1. A D-SLP SHALL be configured in association with SUPL 2.1 and later versions. 2. An E-SLP SHALL be configured in association with SUPL 3.0 and later versions.	SUPLCS V1.0
SUPLCS-IOP-03	A mobile operator MAY utilize the [SUPL MO] management object to define their H-SLP or this reference release.	SUPLCS V1.0

5.11 Privacy

Label	Description	Release
SUPLCS-PRIV-01	SUPLCS SHALL utilize the privacy mechanisms defined in [OMA DM].	SUPLCS V1.0

6. Architectural Model

This section defines the functional components and the interfaces of the SUPL Configuration Services (SUPLCS) reference release, thus providing its architecture. The architecture is in alignment with the requirements that have been captured in the Requirements Section of this document. The architecture is described in the following sections.

The SUPLCS reference release defines the requirements and specification for an OMA DM Management Object that will be used to define multiple SLPs and other configuration items for a SET.

6.1 Dependencies

The SUPLCS architecture is directly dependent on the architectures defined for OMA DM. Any defined release for the OMA DM enabler may be used to implement or deploy the SUPL Configuration Services. This is possible as the core schema definition for the OMA Device Management Object is backwards compatible across releases.

The SUPLCS architecture is dependent on the architectures defined in:

[OMA-DM-V1_2_1]	"Device Management", Version 1.2.1, Open Mobile Alliance™, OMA-ERP-DM-V1_2_1, URL:http://www.openmobilealliance.org/
[OMA-DM-V1_3]	"Device Management", Version 1.3, Open Mobile Alliance™, OMA-ERP-DM-V1_3, URL:http://www.openmobilealliance.org/
[OMA-DM-V2_0)]	"Device Management", Version 2.0, Open Mobile Alliance™, OMA-ERP-DM-V2_0, URL:http://www.openmobilealliance.org/

6.2 Architectural Diagram

The architecture diagram in Figure 1: SUPL Configuration Services Component Architecture shows the high level components of the OMA DM architectural model. The SUPLCS Management Object is stored within the DM Data Repository. One or more SUPLCS Management Objects may be defined within the DM Data Repository depending on the mobile operator needs.

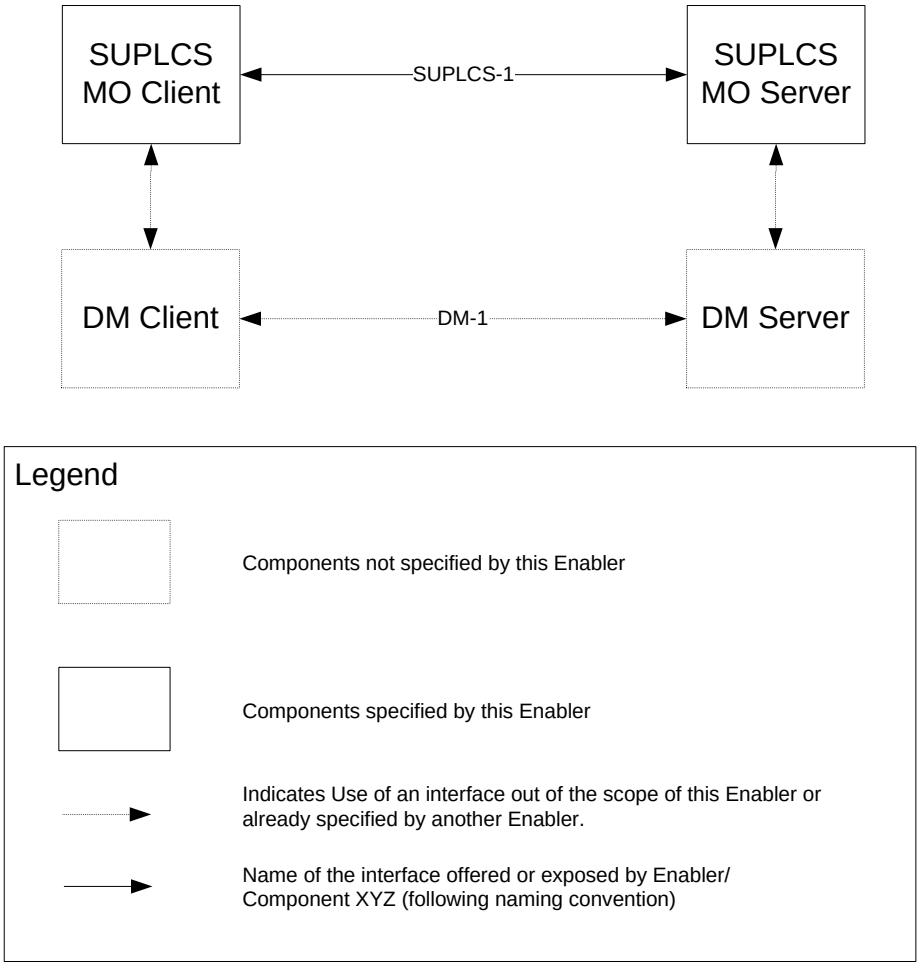

Figure 1: SUPL Configuration Services Component Architecture

6.3 Functional Components and Interfaces/reference points definition

See the references in [OMA DM] for a description of the OMA DM components and interfaces.

6.3.1 Components

6.3.1.1 SUPLCS MO Client

The SUPLCS MO Client is a logical entity, which is responsible for querying the SUPLCS Server for the Management Object. The results of the queries will drive the SUPL Location Platform to utilize for an individual location request. The SUPLCS MO Client leverages the DM Client to communicate with the SUPLCS MO Server.

6.3.1.2 SUPLCS MO Server

The SUPLCS MO Server is a logical entity, which is dedicated to respond to queries submitted by the SUPLCS MO Client. The SUPLCS MO Server leverages the functionalities provided by the DM Server to communicate with the SUPLCS MO Client.

6.3.1.3 DM Client

The OMA DM Client is defined in the [OMA DM] enabler and is the subject of those specifications.

6.3.1.4 DM Server

The OMA DM Server is defined in the [OMA DM] enabler and is the subject of those specifications.

6.3.2 Interfaces

6.3.2.1 SUPLCS-1 Interface

The SUPLCS-1 interface allows the SUPLCS MO Client to send queries to the SUPLCS MO Server for the SUPLCS MO elements using the underlying DM-1 interface.

6.3.2.2 DM-1 Interface

The DM-1 interface is defined in the [OMA DM] enabler and is the subject of those specifications. It provides a generic interface over which device management commands, status and MO data are exchanged between the SUPLCS MO Server and the SUPLCS MO Client.

7. OMA SUPL Configuration Services Management Object

The OMA SUPL Configuration Services management object (MO) is an object, which is used to manage OMA SUPL settings. The MO enables management of OMA SUPL related settings on behalf of the end user. E.g. it SHOULD be possible to set SUPL and Application configuration data without notifying the end user. The OMA SUPL Configuration Services MO is defined using the OMA DM Device Description Framework as described in [OMA DM].

The Management Object Identifier is: urn:oma:mo:oma-suplcs:1.0

7.1 Guide to the SUPLCS Managment Object

The following table gives an overview of the SUPL CS Management object.

Major Node	**Description**
OperatorInfo	The OperatorInfo node defines the H-SLP, the E-SLPs and the information on the data that has been provisioned by the operator in their instance of the SUPLCS Management Object. The MOElementCounts node has the number of elements provisioned in each list representing each use case. If the element count is zero, then the operator does not support that use case. The MOTimestamps node contains the time that each node was updated. Individual SUPLCS Clients may query this node to determine the values or they may bypass and perform direct queries to the rest of the MO.
ApplicationList	This node provides a list of applications that is indexed by the application name and digital signing certificate of the application making the location request. The client may query for the ApplicationID information as defined in SUPL 2.0 and above, and the H-SLP to route the request to. If there is no data returned, the configured operator's H-SLP should be utilized.
DiscoveredSLPList	The DiscoveredSLPList allows for configuration of D-SLPs that may be utilized by the handset. The handset may find a D-SLP utilizing the SUPLCS method and then based on interaction with the D-SLP enable additional capabilities. D-SLP settings within the SUPL protocol SHALL always override the DiscoveredSLPList configuration to prevent conflicts.

Table 1: Guide to the SUPLCS Managment Object

The following diagram describes the SUPL CS Management Object tree visually.

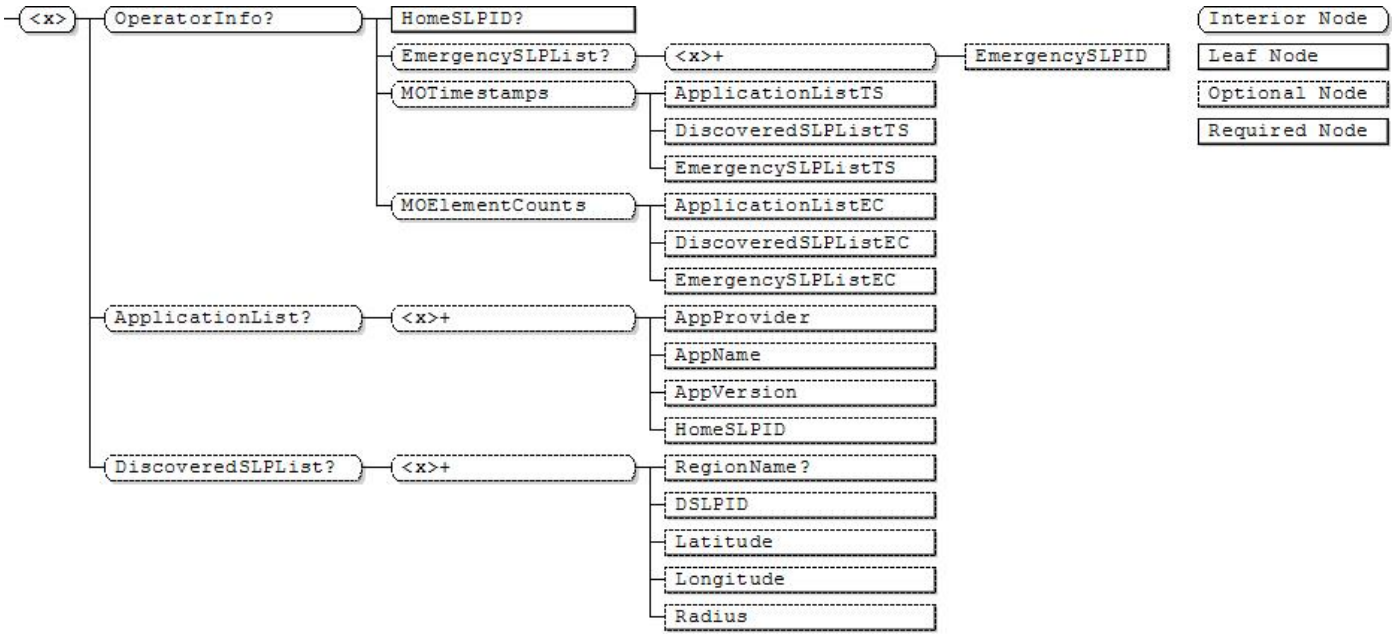

Figure 2: The OMA SUPL Configuration Services Management Object tree

7.2 Management Object Parameters

This section describes the parameters for OMA SUPL Configuration Services Management Object.

<x>

Status	Occurrence	Format	Min. Access Types
Required	One	node	Get

This node is the top level node representing content for the SUPL configuration for a single operator. Management Object Identifier for the SUPLCS MO MUST be: “urn:oma:mo:oma-suplcs:1.0”.

<x>/OperatorInfo

Status	Occurrence	Format	Min. Access Types
Required	ZeroOrOne	node	Get

This optional node specifies the SUPLCS capabilities the mobile operator has configured for their specific SUPLCS MO.

<x>/ OperatorInfo/HomeSLPID

Status	Occurrence	Format	Min. Access Types
Required	ZeroOrOne	chr	Get

The H-SLP ID for the operator. This element is not provisioned if alternative methods are used to configure the H-SLP for the operator. Provides the IP address or Fully Qualified Domain Name of the H-SLP.

<x>/ OperatorInfo/EmergencySLPList

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	node	Get

The list of E-SLPs for the operator.

<x>/ OperatorInfo/EmergencySLPList/<x>

Status	Occurrence	Format	Min. Access Types
Optional	OneOrMore	node	Get

This interior node acts as a placeholder for one or more E-SLPs.

<x>/ OperatorInfo/EmergencySLPList/<x>/EmergencySLPID

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

Provides the IP address or Fully Qualified Domain Name of the E-SLP.

<x>/OperatorInfo/MOTimestamps

Status	Occurrence	Format	Min. Access Types
Optional	One	node	Get

This is a series of timestamps when the major nodes have been updated to minimize interaction with the SET.

<x>/OperatorInfo/MOTimestamps/ApplicationListTS

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

The UTC timestamp the ApplicationList was last updated. The format of the string should be in YYYMMDDhhmm format.

<x>/OperatorInfo/MOTimestamps/DiscoveredSLPListTS

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

The UTC timestamp the DiscoveredSLPList was last updated. The format of the string should be in YYYYMMDDhhmm format.

<x>/OperatorInfo/MOTimestamps/EmergencySLPListTS

Status	Occurrence	Format	Min. Access Types
Optional	One	time	Get

The UTC timestamp the EmergencySLPList was last updated. The format of the string should be in YYYYMMDDhhmm format.

<x>/OperatorInfo/MOElementCounts

Status	Occurrence	Format	Min. Access Types
Optional	One	node	Get

This is a series of the number of elements provisioned for each major element.

<x>/OperatorInfo/MOElementCounts/ApplicationListEC

Status	Occurrence	Format	Min. Access Types
Optional	One	int	Get

The count of the serving applications provisioned.

<x>/OperatorInfo/MOElementCounts/DiscoveredSLPListEC

Status	Occurrence	Format	Min. Access Types
Optional	One	int	Get

The count of the D-SLPs provisioned.

<x>/OperatorInfo/MOElementCounts/EmergencySLPListEC

Status	Occurrence	Format	Min. Access Types
Optional	One	int	Get

The count of the E-SLPs provisioned.

<x>/ApplicationList

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	node	Get

List of Applications configured for steering to a specific H-SLP.

<x>/ApplicationList/<x>

Status	Occurrence	Format	Min. Access Types
Optional	OneOrMore	node	Get

The ApplicationList/<x> element is made up of the concatenation of the application name, ":" and the hashcode of the digital signature of the application. e.g. "com.myloccompany.navapp:186509321"

<x>/ApplicationList/<x>/AppProvider

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

The application provider.

<x>/ApplicationList/<x>/AppName

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

The application name.

<x>/ApplicationList/<x>/AppVersion

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

The application version.

<x>/ApplicationList/<x>/HomeSLPID

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

Provides the IP address or Fully Qualified Domain Name of the H-SLP to be used for this application.

<x>/DiscoveredSLPList

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	node	Get

The list of D-SLPs associated with the operator's H-SLP.

<x>/DiscoveredSLPList/<x>

Status	Occurrence	Format	Min. Access Types
Optional	OneOrMore	node	Get

An individual D-SLP.

<x>/DiscoveredSLPList/<x>/RegionName

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	chr	Get

The name of the region the D-SLP covers.

<x>/DiscoveredSLPList/<x>/DSLPID

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

Provides the IP address or Fully Qualified Domain Name of the D-SLP.

<x>/DiscoveredSLPList/<x>/Latitude

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

The latitude of the region in decimal degrees.

<x>/DiscoveredSLPList/<x>/Longitude

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

The longitude of the region in decimal degrees.

<x>/DiscoveredSLPList/<x>/Radius

Status	Occurrence	Format	Min. Access Types
Optional	One	chr	Get

The radius of the circle from the latitude and longitude of the regional service in meters.

8. Release Information

8.1 Supporting File Document Listing

Doc Ref	Permanent Document Reference	Description
Supporting Files		
[SUPLCS XML]	OMA-SUP-MO_SUPLCS-V1_0-20140318-A	The XML definition for the SUPL CS Management Object.

Table 2: Listing of Supporting Documents in SUPL Configuration Services Release

8.2 OMNA Considerations

The OMNA portal needs to maintain the following schema namespace into Schema Namespace Registry

Description	Registered URN	Schema Links
XSD Schema for SUPLCS 1.0	urn:oma:mo:oma-suplcs:1.0	http://www.openmobilealliance.org/tech/profiles/OMA-SUPL_Configuration_Services-V1_0.xml

Table 3: OMNA Considerations

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-RR-SUPL_Configuration_Services-V1_0-20140318-A	18 Mar 2014	Status changed to Approved by TP TP Ref # OMA-TP-2014-0055-INP_SUPL_Configuration_Services_V1_0_RRP_for_Final_Approval