



Enabler Release Definition for LPP Extensions (LPPe) Candidate Version 2.0 – 21 May 2013

Open Mobile Alliance
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1. Scope

The scope of this document is limited to the Enabler Release Definition of LPP Extensions according to OMA Release process and the Enabler Release specification baseline listed in section 5.

2. References

2.1 Normative References

- [RFC2119] “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997,
URL:<http://www.ietf.org/rfc/rfc2119.txt>
- [SCRRULES] “SCR Rules and Procedures”, Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures,
URL:<http://www.openmobilealliance.org/>
- [3GPP LPP] 3GPP TS 36.355 LTE Positioning Protocol,
URL:<http://www.3gpp.org>
- [LPPE 2.0 RD] “LPPE Requirements Document”, Version 2.0, Open Mobile Alliance™, OMA-RD-LPPE-V2_0
URL:<http://www.openmobilealliance.org/>
- [LPPE 2.0 TS] “LPPE Technical Specification”, Version 2.0, Open Mobile Alliance™, OMA-TS-LPPE-V2_0
URL:<http://www.openmobilealliance.org/>

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

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. |
| Server | Termination point of LPP/LPPE |
| Target | Termination point of LPP/LPPE |

3.3 Abbreviations

| | |
|---------------|--------------------------------|
| E-SMLC | Evolved SMLC |
| EPDU | External Protocol Data Unit |
| ERDEF | Enabler Requirement Definition |
| ERELD | Enabler Release Definition |
| LPP | LTE Positioning Protocol |
| LPPE | OMA LPP Extensions |
| LTE | Long-Term Evolution |
| OMA | Open Mobile Alliance |
| OMNA | Open Mobile Naming Authority |
| SET | SUPL-Enabler Terminal |
| SLP | SUPL Location Platform |
| SMLC | Serving Mobile Location Centre |
| SUPL | Secure User Plane Location |

4. Release Version Overview

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

LTE Positioning Protocol LPP [3GPP LPP] is a positioning protocol for E-UTRAN control plane. The LPP termination points are “server” and “target”, which in the E-UTRAN control plane are the E-SMLC and the end-user device, respectively. However, LPP has been designed in such a way that it can also be utilized outside the control plane domain such as in the user plane in the context of SUPL. In the user plane use, the LPP termination points are most typically SLP (“server”) and the SET (“target”). Also SET-to-SET use cases are being considered.

LPP elementary messages (Request and Provision of Capabilities and Location Information and Assistance Data) each include a container, an EPDU, which can be used by standardization fora outside 3GPP to define their own extensions to the LPP messages. OMA LPP Extensions [LPPE 2.0 RD] take advantage of this option.

The advantages resulting from OMA building LPPE on top of the 3GPP-defined LPP include the convergence of control and user plane positioning protocols, reduced work load and being able to use the same LPPE protocol stack both in the control and user plane.

The main purpose of this LPPE release is to add new positioning methods and enhancements to LPPE Release 1. These new positioning methods and enhancements will improve location service quality such as service availability, accuracy and time to fix and extend the service to areas traditionally difficult to serve (e.g., indoor locations)

4.1 Version 1.0 Functionality

3GPP LPP is a positioning protocol that provides procedures for

- Request and Provision of location information including raw measurements
- Request and Provision of assistance data
- Request and Provision of capabilities

OMA LPP Extensions (LPPE) build on the 3GPP-defined LPP and extends the location, measurement and assistance data capabilities beyond 3GPP LPP without unnecessarily duplicating the work done in 3GPP.

The OMA LPPE Release 1.0 enables support for

- High accuracy GNSS methods in the form of new positioning methods and assistance data types
- Emerging radio network –based positioning technologies including the radio network measurement reports for selected radio access types
- Terminal-to-terminal positioning and assistance data transfer

Moreover, OMA LPPE attempts to be bearer-independent as far as possible with respect to non-bearer associated position methods like A-GNSS and any terrestrial method applicable to a non-serving network.

Security, authentication, privacy and charging are out of scope of LPPE. It is assumed that these services are provided by the user plane protocol which uses LPP/LPPE as the positioning protocol.

4.2 Version 1.1 Functionality

The OMA LPPE Release 1.1 enables support for:

- Broadcast of unsolicited LPP/LPPE Provide Assistance Data messages
- Request and provision of assistance data point to point related to LPP/LPPE broadcast support

- Support of Ground Morphology assistance data (altitude and/or building height)

4.3 Version 2.0 Functionality

The OMA LPPE Release 2.0 enables support for:

- Image Recognition Based Positioning (IRBP). IRBP uses image feature analysis in the target device or on the location server to determine, or help determine, the target device's position.
- Pedestrian Dead Reckoning (PDR). PDR enables pedestrian borne target devices to calculate their current position by extrapolating from previously known positions using target device sensor input and server provided step length models and environment information (e.g., building information, floor plans etc.).
- Enhanced positioning accuracy and availability in WLAN environments.
- Crowd Sourcing via measurements a target device normally obtains for its own location.
 - NOTE: crowd sourcing may require support from SUPL as well as LPPE
- Provision of maps in standard existing format. Maps can be provided for both indoor and outdoor. Map information may include additional information such as for example altitude information, etc.

5. Document Listing for LPPE 2.0

This section is normative.

| Doc Ref | Permanent Document Reference | Description |
|---------------------------------|------------------------------|--|
| Requirement Document | | |
| [LPPE 2.0 RD] | OMA-RD-LPPE-V2_0-20130521-C | Requirements Document for LPPE 2.0 Enabler |
| Architecture Document | | |
| | | None will be defined. |
| Technical Specifications | | |
| [LPPE 2.0 TS] | | Technical Specification for LPPE 2.0 Enabler |
| Supporting Files | | |
| | | None will be defined |

Table 1: Listing of Documents in LPPE 2.0 Enabler

6. OMNA Considerations

LPPE enabler allows carrying vendor/operator-specific data between a client and a server. In this case the data is identified by vendor/operator ID, which are allocated and maintained by OMNA.

The up-to-date IDs are available at <http://www.openmobilealliance.org/Tech/OMNA/OMNA-vendor-operator-ID.aspx>.

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 LPPE - Client Requirements

Static Conformance Requirements for an LPPE Client are specified in Appendix B.1 of [LPPE 2.0 TS].

9. ERDEF for LPPE - Server Requirements

Static Conformance Requirements for an LPPE Server are specified in Appendix B.2 of [LPPE 2.0 TS].

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 2.0 History

| Document Identifier | Date | Sections | Description |
|---|-------------|----------|--|
| Draft Versions OMA-ERELED-LPPE-V2_0 | 21 Mar 2013 | | Baseline |
| | 03 Apr 2013 | 5 | Editorial to update document list. |
| | 30 Apr 2013 | 2.1, 5 | OMA-LOC-2013-0044- CR_LPPE_2_0_ERELED_Review_Comment_Resolution_LGE |
| Candidate Version OMA-ERELED-LPPE-V2_0 | 21 May 2013 | All | Status changed to Candidate by TP TP Ref # OMA-TP-2013-0134- INP_LPPE_2.0_for_Candidate_Approval |