



# Enabler Validation Plan for Lightweight M2M

## Candidate Version 1.0 – 19 Aug 2014

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**Open Mobile Alliance**  
OMA-EVP-LightweightM2M-V1\_0-20140819-C

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# 1. Scope

This document details the Validation plan for the Lightweight M2M V1.0 Enabler Release. The successful accomplishment of the validation activities will be required for the Enabler to be considered for Approved status.

The validation plan for the Lightweight M2M V1.0 Enabler Release specifications is based on testing expectations in the Enabler Test Requirements (ETR). While the specific test activities to be performed are described in the Enabler Test Specification (ETS) the test environment is described in this plan. This test environment details infrastructure, operational and participation requirements identified for the needed testing activities.

## 1.1 Assumptions

None.

## 1.2 Exclusions

None.

## 2. References

### 2.1 Normative References

- [3GPP-TS\_23.003] 3GPP TS 23.003 “Numbering, addressing and identification”
- [CoAP] Shelby, Z., Hartke, K., Bormann, C., and B. Frank, “Constrained Application Protocol (CoAP)”, draft-ietf-core-coap-18, Jun 2013.
- [ETSI TS 102.221] “Smart Cards; UICC-Terminal interface; Physical and logical characteristics”, (ETSI TS 102 221 release 11), [URL:http://www.etsi.org/](http://www.etsi.org/)
- [GlobalPlatform SCP 02] GlobalPlatform v2.2.1 - January 2011 - Appendix E : Secure Channel Protocol 02 (SCP 02)
- [IOPPROC] “OMA Interoperability Policy and Process”, Version 1.1, Open Mobile Alliance™, OMA-IOP-Process-V1\_1, [URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [LWM2M-AD] “Lightweight Machine to Machine Architecture”, Open Mobile Alliance™, OMA-AD-LightweightM2M-V1\_0, [URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [LWM2M-TS] “Lightweight Machine to Machine Technical Specification”, Open Mobile Alliance™, OMA-TS-LightweightM2M-V1\_0, [URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [OBSERVE] Hartke, K. “Observing Resources in CoAP”, draft-ietf-core-observe-11 (work in progress), Oct 2013.
- [PKCS#15] PKCS #15 v1.1: “Cryptographic Token Information Syntax Standard”, RSA Laboratories, June 6, 2000. [URL: ftp://ftp.rsasecurity.com/pub/pkcs/pkcs-15/pkcs-15v1\\_1.pdf](ftp://ftp.rsasecurity.com/pub/pkcs/pkcs-15/pkcs-15v1_1.pdf)
- [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)
- [RFC2234] “Augmented BNF for Syntax Specifications: ABNF”. D. Crocker, Ed., P. Overell. November 1997, [URL:http://www.ietf.org/rfc/rfc2234.txt](http://www.ietf.org/rfc/rfc2234.txt)
- [RFC4122] “A Universally Unique Identifier (UUID) URN Namespace”, P. Leach, et al. July 2005, [URL:http://www.ietf.org/rfc/rfc4122.txt](http://www.ietf.org/rfc/rfc4122.txt)
- [RFC5246] The Transport Layer Security (TLS) Protocol Version 1.2
- [RFC5289] TLS Elliptic Curve Cipher Suites with SHA-256/384 and AES Galois Counter Mode (GCM)
- [RFC5487] Pre-Shared Key Cipher Suites for TLS with SHA-256/384 and AES Galois Counter Mode
- [RFC6347] Rescorla, E. and N. Modadugu, “Datagram Transport Layer Security Version 1.2”, [RFC 6347](#), January 2012.
- [RFC6655] McGrew, D. and D. Bailey, “AES-CCM Cipher Suites for TLS”, RFC6655, July 2012.
- [RFC6690] Shelby, Z. “Constrained RESTful Environments (CoRE) Link Format”, RFC6690, Aug 2012.

### 2.2 Informative References

- [DMREPPRO] “OMA Device Management Representation Protocol, Version 1.3”. Open Mobile Alliance™. OMA-TS-DM\_RepPro-V1\_3. [URL:http://www.openmobilealliance.org](http://www.openmobilealliance.org)
- [OMADICT] “Dictionary for OMA Specifications”, Version x.y, Open Mobile Alliance™, OMA-ORG-Dictionary-Vx\_y, [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”, are normative, unless they are explicitly indicated to be informative.

### 3.2 Definitions

<b>Application</b>	1) The customer's realisation of a service through M2M - e.g. satnav, smart metering
<b>Device</b>	2) Individual software components that run on top of the device's operating system. Access Point Name
<b>Module</b>	The hardware that is realising a function for the customer e.g. a smart meter. A modular component of a device e.g. the radio module housing the SIM

### 3.3 Abbreviations

<b>API</b>	Application Programming Interface
<b>APN</b>	Access Point Name
<b>CoAP</b>	Constrained Application Protocol
<b>CON</b>	Conformance
<b>DM</b>	Device Management
<b>GDSP</b>	Global Data Service Platform
<b>GUI</b>	Graphical User Interface
<b>IMEI</b>	International Mobile Equipment Identity
<b>IMSI</b>	International Mobile Subscriber Identity
<b>IOP</b>	Interoperability
<b>LWM2M</b>	Lightweight Machine to Machine (refers to this OMA enabler)
<b>M2M</b>	Machine to Machine
<b>MSISDN</b>	Mobile Station International Subscriber Directory Number
<b>OMA</b>	Open Mobile Alliance
<b>OpCo</b>	Operating Company
<b>OS</b>	Operating System
<b>SIM</b>	Subscriber Interface Module
<b>UI</b>	User Interface

## 4. Enabler Validation Description

The validation of this enabler will be made based on the successful execution of test cases defined in the [LWM2M-ETS] and that satisfies the agreed test requirements listed in the [LWM2M-ETR].

A summary of test results will be the evidence that those test cases were executed. The lack of open Problem Reports will be the evidence the test cases were successful executed and that any issue found whether on test specifications, technical specifications or other was correctly addressed.



## 5. TestFest Activities

### 5.1 Enabler Test Guidelines

#### 5.1.1 Minimal Test Configuration

To execute all the test cases from [LWM2M-ETS] the minimal test configuration required is:

For a Client – three Servers

For a Server – three Clients

#### 5.1.2 Minimal Participation Guidelines

The ideal participation to proper test the enabler is:

For a Client – three Servers

For a Server – three Clients

#### 5.1.3 Optimal TestFest Achievement Test Case Priority Guidelines

This list represents the current highest priority test cases that the participants should attempt to perform at the event. In order to facilitate maximum test coverage of the functionality of the enabler over a number of TestFests, this list may be modified by the IOP WG between test events to reflect the latest priorities. Therefore the ETS Test Cases listed below represent a subset of all the Test Cases for the Enabler that it is thought can be executed in a single test session at an OMA TestFest. It is not intended to be the only tests executed at a TestFest, and teams are encouraged to execute more tests if they are able to do so in the time allowed.

The list includes:

##### 5.1.3.1 Registration

Description	Test Case Id	Priority
Initial Registration	LightweightM2M-1.0-int-101	A
Registration Update	LightweightM2M-1.0-int-102	A
Deregistration	LightweightM2M-1.0-int-103	A
Registration Update Trigger	LightweightM2M-1.0-int-104	B

##### 5.1.3.2 Device Object-Related Use Cases

Description	Test Case Id	Priority
Querying basic information from the client in Plain Text format	LightweightM2M-1.0-int-201	A
Querying basic information from the client in TLV format	LightweightM2M-1.0-int-201	A
Querying basic information from the client in JSON format	LightweightM2M-1.0-int-201	A
Querying the firmware version from the client	LightweightM2M-1.0-int-202	A
Rebooting the device	LightweightM2M-1.0-int-203	A
Querying power status of the terminal	LightweightM2M-1.0-int-204	A

##### 5.1.3.3 Device Firmware Update

Description	Test Case Id	Priority
Firmware update (via COAP)	LightweightM2M-1.0-int-301	A
Firmware update (via alternative mechanism)	LightweightM2M-1.0-int-302	B

### 5.1.3.4 Connectivity Object Monitoring

Description	Test Case Id	Priority
Querying of connectivity parameters	LightweightM2M-1.0-int-401	A

### 5.1.3.5 Observe and Notify

Description	Test Case Id	Priority
Observation and notification of parameter values	LightweightM2M-1.0-int-501	A
Cancel observations using “Cancel Observation” operation	LightweightM2M-1.0-int-502	B
Cancel observations using “Write Attributes” with Cancel parameter	LightweightM2M-1.0-int-503	B

### 5.1.3.6 Security

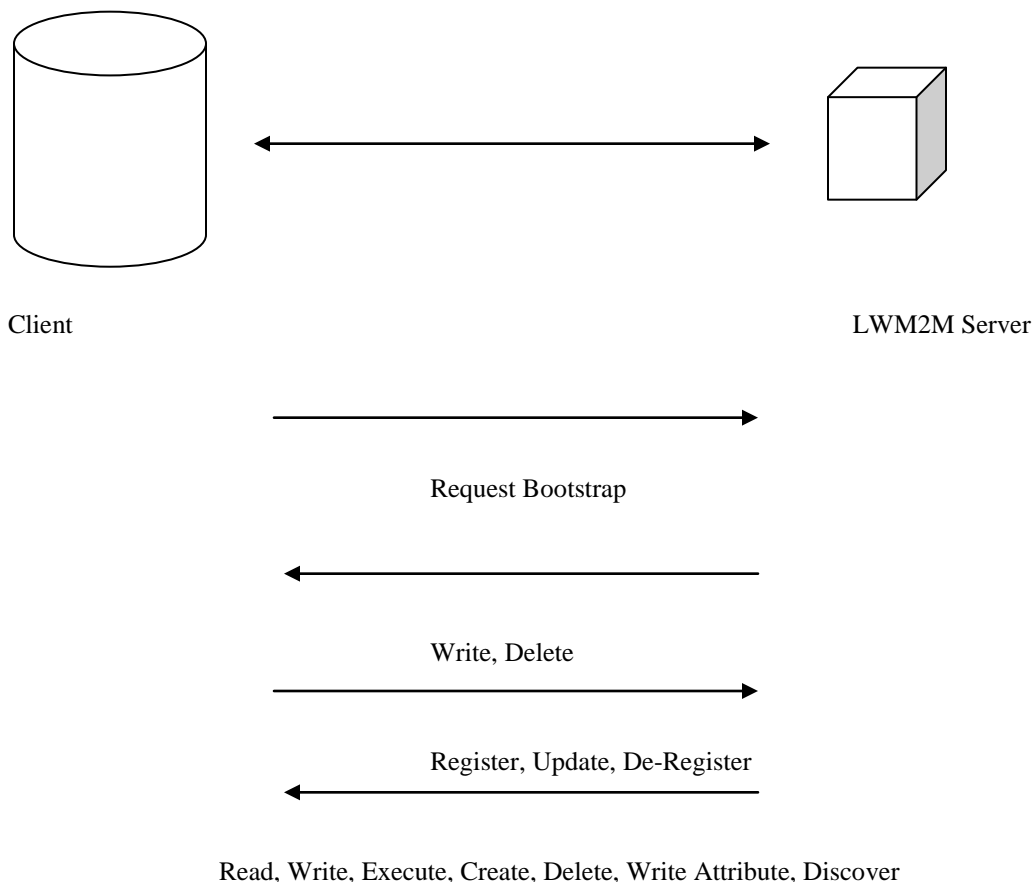
Description	Test Case Id	Priority
UDP Channel Security – Pre-shared Key Mode	LightweightM2M-1.0-int-601	A

## 5.2 Enabler Test Requirements

### 5.2.1 Test Infrastructure Requirements

The LWM2M enabler tests are carried out using the LWM2M protocol and objects, and using the underlying protocols such as [CoAP]. The client could be embedded in a M2M device or module connected via UDP and SMS with the LWM2M server.

### 5.2.2 Enabler Execution Flow



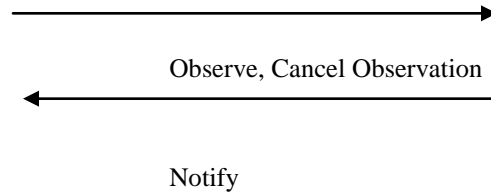


Figure 1: Enabler Execution Flow

### 5.2.3 Test Content Requirements

None

### 5.2.4 Test Limitations

#### 5.2.4.1 Physical

None

#### 5.2.4.2 Resources

None

### 5.2.5 Test Restrictions

Restrictions to the testing might happen due to the availability of alternative options to update the firmware.

### 5.2.6 Test Tools

No test tool required. However the availability of HTTP, TCP/IP and other protocol trace tools are welcome, although not required.

#### 5.2.6.1 Existing Tools to be Used

There are several existing trace tools for the relevant protocols that can be used.

#### 5.2.6.2 Test Tool Requirements

The only requirement is that the test tool shall not interfere in the communication between clients and servers.

### 5.2.7 Resources Required

As a minimum it will be requires a resource, eventually shared, to operate each client and server under test.

## 5.3 Tests to be performed

The following sections describe the tests related to the formal TestFest validation activities.

### 5.3.1 Entry Criteria for TestFest

The following tests need to be performed and passed by implementations by members wishing to participate in the TestFest. This ensures minimal requisite capability of the implementations. The tests are defined in the ETS [LWM2M-ETS] and any special comments are noted.

Test Case Id	Special Conditions
LightweightM2M-1.0-int-101	
LightweightM2M-1.0-int-102	
LightweightM2M-1.0-int-201	
LightweightM2M-1.0-int-204	

Table 1: Listing of Tests for Entry Criteria for TestFest

### 5.3.2 Testing to be performed at TestFest

The following tests need to be performed to fully cover the range of capabilities of the enabler and defined protocols. These tests are to be covered in the TestFest. The tests are defined in the ETS [LWM2M-ETS] and any special comments are noted.

- All the test cases from the LWM2M ETS

## 5.4 Enabler Test Reporting

### 5.4.1 Problem Reporting Requirements

Normal Reporting, no special reporting required.

### 5.4.2 Enabler Test Requirements

Normal Reporting, no special reporting required.

## 6. Alternative Validation Activities

The validation of the enabler can be done via test results achieved through normal test fests, via virtual test fests or bilateral test sessions.

Test results from events organised by other forums can be considered also relevant for the validation after analyses of DM and IOP.

## 7. Approval Criteria

The LWM2M enabler can be put in the Approved state when:

- The Enabler has been tested successfully at 2 Test Fests or
- 3 clients and 3 servers have successfully run bilateral tests sessions and
- No open PRs exist.

### 7.1 Enabler Validation Test Cases

The following table should list the set of tests that are used for enabler validation.

Test Case Id	ETR Requirement Id/Feature Key	ETR Status	Notes
LightweightM2M-1.0-int-101	BT-MODE-C, BT-MODE-S	M	
LightweightM2M-1.0-int-102	IF-CR-C, IF-CR-S	M	
LightweightM2M-1.0-int-103	IF-CR-C, IF-CR-S	M	
LightweightM2M-1.0-int-201	DT-PT-C, DT-PT-S	M	
	OB-DEVICE-C, OB-DEVICE-S	M	
	DT-TLV-C, DT-TLV-S	M	
	DT-JSON-S	M	
	DT-JSON-C	O	
LightweightM2M-1.0-int-202	IF-DMSE-C, IF-DMSE-S	M	
LightweightM2M-1.0-int-203	IF-DMSE-C, IF-DMSE-S	M	
LightweightM2M-1.0-int-204	IF-DMSE-C, IF-DMSE-S	M	
LightweightM2M-1.0-int-301	OB-FU-C, OB-FU-S	O	
LightweightM2M-1.0-int-401	OB-SERVER-C, OB-SERVER-S	M	
	OB-CON-C, OB-CON-S	O	
LightweightM2M-1.0-int-501	IF-IR-C; IF-IR-S	M	
LightweightM2M-1.0-int-601	SEC-C, SEC-S, TRANS-C, TRANS-S	M	

**Table 2: Enabler Validation Test Cases**

### 7.2 Non-Covered ETR Requirements

Any restrictions, limitations and/or infeasibility of testing of the ETR requirements should be stated in this section.

If new information about limitations and/or infeasibility of testing of any of the ETR requirements is discovered, this section should be updated accordingly.

ETR Requirement Id	ETR Status	Notes
OB-SERVER SECURITY-C, OB-SERVER SECURITY-S	M	
DT-OP-C, DT-OP-S	M	
IF-BT-C	O	
BOOT-FB-C	O	
BOOT-SC-C	O	
BOOT-CI-C	O	
MEC-QUEUE-C	O	
OB-AC-C, OB-AC-S	O	
OB-LOC-C, OB-LOC-S	O	
OB-CS-C, OB-CS-S	O	

**Table 3: Non-Covered ETR 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 1.0 History

Document Identifier	Date	Sections	Description
Draft Version OMA-EVP-LightweightM2M-V1_0	25 April 2014	All	The initial version of this document.
Candidate Version OMA-EVP-LightweightM2M-V1_0	19 Aug 2014	n/a	Status changed to Candidate by TP TP Ref # OMA-TP-2014-0171- INP_LightweightM2M_V1_0_EVP_for_Candidate_approval