Use of this document is subject to all of the terms and conditions of the Use Agreement located at https://www.omaspecworks.org/about/policies-and-terms-of-use/.

Unless this document is clearly designated as an approved specification, this document is a work in process, is not an approved Open Mobile Alliance™ specification, and is subject to revision or removal without notice.

You may use this document or any part of the document for internal or educational purposes only, provided you do not modify, edit or take out of context the information in this document in any manner. Information contained in this document may be used, at your sole risk, for any purposes. You may not use this document in any other manner without the prior written permission of the Open Mobile Alliance. The Open Mobile Alliance authorizes you to copy this document, provided that you retain all copyright and other proprietary notices contained in the original materials on any copies of the materials and that you comply strictly with these terms. This copyright permission does not constitute an endorsement of the products or services. The Open Mobile Alliance assumes no responsibility for errors or omissions in this document.

Each Open Mobile Alliance member has agreed to use reasonable endeavors to inform the Open Mobile Alliance in a timely manner of Essential IPR as it becomes aware that the Essential IPR is related to the prepared or published specification. However, the members do not have an obligation to conduct IPR searches. The declared Essential IPR is publicly available to members and non-members of the Open Mobile Alliance and may be found on the “OMA IPR Declarations” list at https://www.omaspecworks.org/about/intellectual-property-rights/. The Open Mobile Alliance has not conducted an independent IPR review of this document and the information contained herein, and makes no representations or warranties regarding third party IPR, including without limitation patents, copyrights or trade secret rights. This document may contain inventions for which you must obtain licenses from third parties before making, using or selling the inventions. Defined terms above are set forth in the schedule to the Open Mobile Alliance Application Form.

NO REPRESENTATIONS OR WARRANTIES (WHETHER EXPRESS OR IMPLIED) ARE MADE BY THE OPEN MOBILE ALLIANCE OR ANY OPEN MOBILE ALLIANCE MEMBER OR ITS AFFILIATES REGARDING ANY OF THE IPR’S REPRESENTED ON THE “OMA IPR DECLARATIONS” LIST, INCLUDING, BUT NOT LIMITED TO THE ACCURACY, COMPLETENESS, VALIDITY OR RELEVANCE OF THE INFORMATION OR WHETHER OR NOT SUCH RIGHTS ARE ESSENTIAL OR NON-ESSENTIAL.

THE OPEN MOBILE ALLIANCE IS NOT LIABLE FOR AND HEREBY DISCLAIMS ANY DIRECT, INDIRECT, PUNITIVE, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OF DOCUMENTS AND THE INFORMATION CONTAINED IN THE DOCUMENTS.

THIS DOCUMENT IS PROVIDED ON AN "AS IS" "AS AVAILABLE" AND "WITH ALL FAULTS" BASIS.

Copyright 2020 Open Mobile Alliance.

Used with the permission of the Open Mobile Alliance under the terms set forth above.
# Table of Contents

1. Scope
2. References
   2.1. Normative References
   2.2. Informative References
3. LwM2M Release Version Overview
   3.1. Version v1.0 Functionality
   3.2. Version v1.1 Functionality
   3.3. Version v1.1.1 Functionality
   3.4. Version v1.2 Functionality
4. Document Listing for LightweightM2M v1.2
5. Publication Considerations
   5.1. OMNA Considerations
   5.2. IANA Considerations
   5.3. Actions Required on Publication of LwM2M v1.2 specifications
Appendix A. Change History (Informative)
   A.1 Approved Version History
Table of Tables

Table: 2.1-1 Normative References
Table: 2.2-1 Informative References
Table: 4.-1 Document Listing for LightweightM2M v1.2
Table: A.1-1 Approved Version History
1. Scope

The scope of this document is limited to the Enabler Release Definition of LightweightM2M v1.2 according to OMA Release process and the Enabler Release specification baseline listed below.
2. References

2.1. Normative References

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
</table>

Table: 2.1.-1 Normative References

2.2. Informative References

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
</table>

Table: 2.2.-1 Informative References
3. LwM2M Release Version Overview

3.1. Version v1.0 Functionality

Lightweight M2M 1.0 enabler introduces the following features below for the initial release.

- Simple Object based resource model
- Resource operations of creation/retrieval/update/deletion/configuration of attribute
- Resource observation/notification
- TLV/JSON/Plain Text/Opaque data format support
- UDP and SMS transport layer support
- DTLS based security
- Queue mode for NAT/Firewall environment
- Multiple LwM2M Server support
- Basic M2M functionalities: LwM2M Server, Access Control, Device, Connectivity, Firmware Update, Location, Connectivity Statistics

3.2. Version v1.1 Functionality

Version 1.1 of the LwM2M protocol introduced the following new features:

- Enhancement of the LwM2M bootstrapping capabilities allowing for incremental upgrades.
- Improved support for Public Key Infrastructure (PKI) deployments.
- Introduction of enhanced registration sequence mechanisms by the LwM2M Client to LwM2M Server(s).
- Support for LwM2M over TCP/TLS to better support firewall and NAT traversal.
- Better support of LwM2M over Low Power WANs, including 3GPP CIoT & LoRaWAN.
- Extended LwM2M commands to enable Resource Instance level access.
- Performance improvement for retrieving and updating Resources of multiple objects.
- Support for JSON using SenML with CBOR serialization for compressed payload with highly efficient transmission.
- Addition of new data types.

3.3. Version v1.1.1 Functionality

Version 1.1.1 of the LwM2M protocol introduced the following new feature:

- Support for Concise Binary Object Representation (CBOR) format for use with "Read" and "Write" operations on
3.4. Version v1.2 Functionality

Version 1.2 of the LwM2M protocol introduced the following new features:

- New transports for LwM2M; this allows LwM2M messaging to be conveyed over MQTT and over HTTP.

- Optimizations for the bootstrapping interface; this reduces the amount of data and the number of messages transmitted during the bootstrapping exchange.

- Optimizations for the registration interface; this reduces the amount of data transmitted during registration exchanges.

- Optimizations for the information reporting interface; observation attributes may now be included in an Observe operation.

- Support for LwM2M gateway functionality; this allows non-LwM2M IoT devices as well as LwM2M devices behind a gateway to be connected to the LwM2M ecosystem and to manage those devices remotely.

- New, highly optimized encoding format based on CBOR called LwM2M CBOR.

- Enhanced functionality for firmware updates.

- Definition of new notification attributes (edge, confirmable notification, and maximum historical queue). Edge allows notifications to be triggered on rising and falling edges. Confirmable notifications allow the control of reliable transmissions of notifications. Maximum historical queue allows the control of time-series data usage.

- Clarifications of object versioning rules.

- Updates to use the latest communication security protocols based on TLS and DTLS 1.3 (as well as the use of the Connection ID).

- Flexibility to control the use of TLS and DTLS 1.3 through configuration information.

- Untangling the relationship of security credentials and their server configuration.
# 4. Document Listing for LightweightM2M v1.2

<table>
<thead>
<tr>
<th>Doc Ref</th>
<th>Permanent Document Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[lwm2m-schema]</td>
<td>OMA–SUP–XML_LWM2M–V1_1–20180710–A</td>
<td>LwM2M schema for LwM2M v1.1, file name: LWM2M–v1_1.xsd, path:</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="http://www.openmobilealliance.org/tech/profiles">http://www.openmobilealliance.org/tech/profiles</a></td>
</tr>
</tbody>
</table>

Table: 4.-1 Document Listing for LightweightM2M v1.2
5. Publication Considerations

5.1. OMNA Considerations

For LwM2M v1.2:

- New LwM2M Objects as listed in Appendix E of [LightweightM2M_TS_Core].

No additional considerations for v1.2 were identified.

5.2. IANA Considerations

For LwM2M v1.2: OMA is requesting IANA to register a new media type for LwM2M CBOR in the "Media Types" registry and in the "CoAP Content-Formats" registry:

- Type name: application
- Subtype name: vnd.oma.lwm2m+cbor
- Required parameters: none
- Optional parameters: none
- Encoding considerations: binary

No additional considerations for v1.2 were identified.

5.3. Actions Required on Publication of LwM2M v1.2 specifications

- None
Appendix A. Change History (Informative)

A.1 Approved Version History

<table>
<thead>
<tr>
<th>Reference</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMA-ERELD-LightweightM2M-V1.1-20180710-A</td>
<td>10 Jul 2018</td>
<td>Status changed to Approved by DMSE WG on 10 Jul 2018.</td>
</tr>
<tr>
<td>OMA-ERELD-LightweightM2M-V1.2-20201110-A</td>
<td>10 Nov 2020</td>
<td>Status changed to Approved by DMSE WG on 10 Nov 2020.</td>
</tr>
</tbody>
</table>

Table: A.1-1 Approved Version History