

Lightweight M2M – Event Log Object (LwM2M Object – EventLog)

Approved Version 1.0 – 15 Jun 2018

Open Mobile Alliance
OMA-TS-LwM2M_EventLog-V1_0-20180615-A

Use of this document is subject to all of the terms and conditions of the Use Agreement located at <http://www.openmobilealliance.org/UseAgreement.html>.

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 <http://www.openmobilealliance.org/ipr.html>. 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.

© 2018 Open Mobile Alliance All Rights Reserved.

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

Contents

- 1. SCOPE.....4
- 2. REFERENCES5
 - 2.1 NORMATIVE REFERENCES.....5
 - 2.2 INFORMATIVE REFERENCES.....5
- 3. TERMINOLOGY AND CONVENTIONS6
 - 3.1 CONVENTIONS6
 - 3.2 DEFINITIONS.....6
 - 3.3 ABBREVIATIONS6
- 4. INTRODUCTION7
 - 4.1 VERSION 1.07
- 5. USE CASES.....8
 - 5.1 CONTROLLING THE RECORDING OF LOG DATA.....8
 - 5.2 REPORTING THE LOGGING STATUS.....8
 - 5.3 COLLECTING THE LOG DATA9
 - 5.4 CATEGORIZING THE LOG DATA9
- 6. LWM2M OBJECT: EVENT LOG11
- 7. GUIDANCE ON HOW TO USE THE RESOURCE, THE GENERIC OBJECT.....13
- APPENDIX A. CHANGE HISTORY (INFORMATIVE).....14
 - A.1 APPROVED VERSION HISTORY14
- APPENDIX B. EXAMPLE OBJECTS AND RESOURCES (INFORMATIVE).....15

Figures

- Figure 1: Controlling the recording of log data procedure.....8
- Figure 2: Reporting the logging status procedure9
- Figure 3: Collecting the log data procedure9
- Figure 4: Categorizing the log data procedure.....10
- Figure 5: Data Collection Configuration sequence13
- Figure 6: Data Collection Logging nominal sequence13

Tables

- Table 1: Object Instances of the Example15
- Table 2: Event Log Object15

1. Scope

This document defines a set of Objects to be used in conjunction with the Lightweight M2M enabler in order to interact with event logs within a device.

The LwM2M object provides a standardised interface to query logs within a device. The actual implementation of the underlying log functionality is outside the scope of this TS.

2. References

2.1 Normative References

[3GPP-TS_23.203] 3GPP TS 23.203 “ Policy and charging control architecture”
[URL:http://www.3gpp.org](http://www.3gpp.org)

2.2 Informative References

[3GPP-TS_21.905] 3GPP TS “3GPP Vocabulary” [URL:http://www.3gpp.org](http://www.3gpp.org)

[OMADICT] “Dictionary for OMA Specifications”, Open Mobile Alliance™,
OMA-ORG-Dictionary-V2_9, [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” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

LTE WB-E-UTRAN as defined in [3GPP-TS_23.401].

NB-IoT NarrowBand IoT is a subset of E-UTRAN.

See also [3GPP-TS_21.905] for 3GPP-specific definitions.

3.3 Abbreviations

AS Application Server

See also [3GPP-TS_21.905] for 3GPP-specific abbreviations.

4. Introduction

This specification enables the transfer of log information from a device to an LwM2M server.

4.1 Version 1.0

V1.0 of the specification covers:

- (1) Communication of generic log information

5. Use cases

5.1 Controlling the recording of log data

This uses the LogStart/Stop resource, 4011/4012

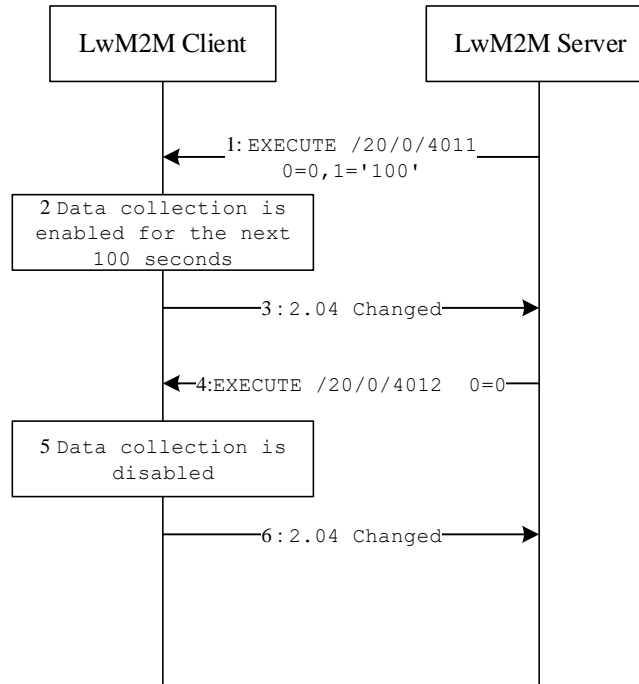


Figure 1: Controlling the recording of log data procedure

1. The LwM2M Server sends an EXECUTE command to the LwM2M Client on the device specifying
 - the IDs of the Log Object and its instance (/20/0),
 - the Log Start Resource ID (4011) to indicate to start the Data Collection logging process and
 - the payload containing the arguments of the EXECUTE command : namely argument 1 for indicating a Data Collection Period of 100s is requested, and argument 0 (which could be omitted) for indicating that the logging process is started with a virgin Data Collection
2. The LwM2M Client enables log data collection for the next 100 seconds
3. The LwM2M Client sends successful response to LwM2M Server.
4. The LwM2M Server sends an EXECUTE command to the LwM2M Client on the device specifying
 - the IDs of the Log Object and its Instance (20/0),
 - the Log Start Resource ID (4012) to indicate to stop the Data Collection logging process and
 - the payload containing the argument 0 (which could be omitted here) of the EXECUTE command for indicating that Data Collection is preserved when the logging process is stopped
5. The LwM2M Client disable log data collection
6. The LwM2M Client sends successful response to LwM2M Server.

5.2 Reporting the logging status

This uses the LogStatus resource 4013. The LogStatus could be reported either by a READ from the LwM2M Server or NOTIFICATION from the LwM2M Client. This use case introduces the READ for example.

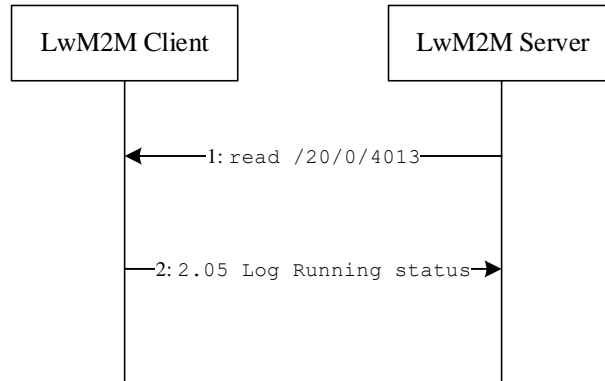


Figure 2: Reporting the logging status procedure

1. The LwM2M Server sends a read request to the LwM2M Client running on the device specifying
 - the IDs of the Log Object and its instance (/20/0),
 - the LogStatus Resource ID 4013 to indicate to get the log status information.
2. The LwM2M Client returns the log running status to the LwM2M server

5.3 Collecting the log data

This uses the LogData resource, 4014

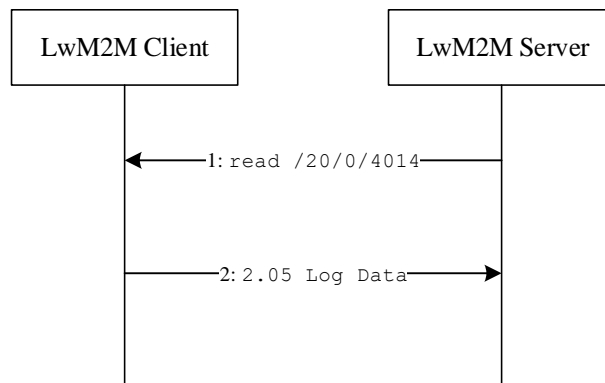


Figure 3: Collecting the log data procedure

1. The LwM2M Server sends a read request to the LwM2M Client running on the device specifying:
 - the IDs of the Log Object and its instance (/20/0),
 - the LogData Resource ID 4014 to indicate to get the log data information.
2. The LwM2M Client returns the log data to the LwM2M Server

5.4 Categorizing the log data

This uses the LogClass resource, 4010

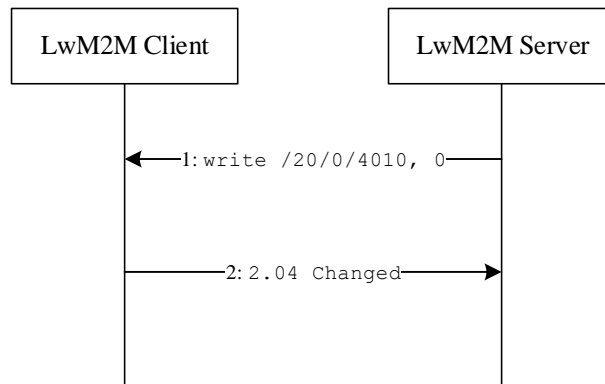


Figure 4: Categorizing the log data procedure

1. The LwM2M Server sends a write request to the LwM2M Client specifying:
 - the IDs of the Log Object and its instance (/20/0),
 - the Log Class Resource ID 4010 to indicate to set the log class information,
 - the payload containing the argument 0 of the EXECUTE command for indicating that only generic log class should be collected.
2. The LwM2M Client sends response to the LwM2M Server with the changed result.

6. LwM2M Object: Event Log

Description

The Event Log Object is a single Instance Object defined for logging data in a straightforward and generic way.

The Resources of that Object are based on the OMA LwM2M set of reusable Resources dedicated to logging event activity.

Object definition

| Name | Object ID | Object Version | LwM2M Version |
|----------------------|-----------|----------------|---------------|
| Event Log | 20 | 1.0 | 1.0 |
| Object URN | | Instances | Mandatory |
| urn:oma:lwm2m:oma:20 | | Single | Optional |

Resource Definitions

| ID | Name | Operations | Instances | Mandatory | Type | Range or Enumeration | Units | Description |
|------|-----------|------------|-----------|-----------|---------|----------------------|-------|---|
| 4010 | LogClass | RW | Single | Optional | Integer | 255 | | Define the Log Event Class: 0: generic (default) 1: system 2: security 3: event 4: trace 5: panic 6: charging [7-99]: reserved [100-255]: vendor specific |
| 4011 | LogStart | E | Single | Optional | none | | | Actions: a) Start data collection(DC) b) LogStatus is set to 0 (running) c) DC is emptied (default) or extended according arg'0' value Arguments definitions are described in the table below. |
| 4012 | LogStop | E | Single | Optional | none | | | Actions: a) Stop data collection(DC) b) 1st LSB of LogStatus is set to "1"(stopped) c) DC is kept (default) or emptied according arg'0' value Arguments definitions are described in the table below. |
| 4013 | LogStatus | R | Single | Optional | Integer | 8-bits | | Data Collection process status: Each bit of this Resource Instance value defines a specific status : 1st LSB 0=running, 1=stopped 2nd LSB 1=LogData contains |

| | | | | | | | | |
|------|---------------|----|--------|-----------|---------|-----|--|---|
| | | | | | | | | Valid Data 0=LogData doesn't contain Valid Data 3rd LSB 1=Error occurred during Data Collection 0=No error [4th -7th] LSB : reserved 8th LSB: vendor specific. |
| 4014 | LogData | R | Single | Mandatory | Opaque | | | Read Access on that Resource returns the Data Collection associated to the current Object Instance. |
| 4015 | LogDataFormat | RW | Single | Optional | Integer | 255 | | when set by the Server, this Resource indicates to the Client, what is the Server preferred data format to use when the LogData Resource is returned. when retrieved by the Server, this Resource indicates which specific data format is used when the LogData Resource is returned to the Server 0 or Resource not present : no specific data format (sequence of bytes) 1 : OMA-LwM2M TLV format 2 : OMA-LwM2M JSON format 3: OMA-LwM2M CBOR format [4..99] reserved [100..255] vendor specific data format |

Execution Resource Arguments Definition

| ID | Resource Name | Order | Name | Type | Range or Enum | Unit | Description |
|------|---------------|-------|------------------------|---------|---------------|------|--|
| 4011 | LogStart | 0 | Data Collection Mode | Integer | [0-1] | | <ul style="list-style-type: none"> 0 or no argument (default) : the DC is emptied 1 : the DC is extended |
| | | 1 | Data Collection Period | Integer | - | sec | <ul style="list-style-type: none"> 0 or no argument (default) : the DC is stopped by the LogStop action only the value in seconds after which the Data Collection is stopped |
| 4012 | LogStop | 0 | Data Collection Mode | Integer | [0-1] | | <ul style="list-style-type: none"> 0 or no argument (default) : the DC is kept 1 : the DC is emptied |

7. Guidance on how to use the resource, the generic object

- Configuration phase: the LogClass is set, the OBSERVE on LogStatus is requested

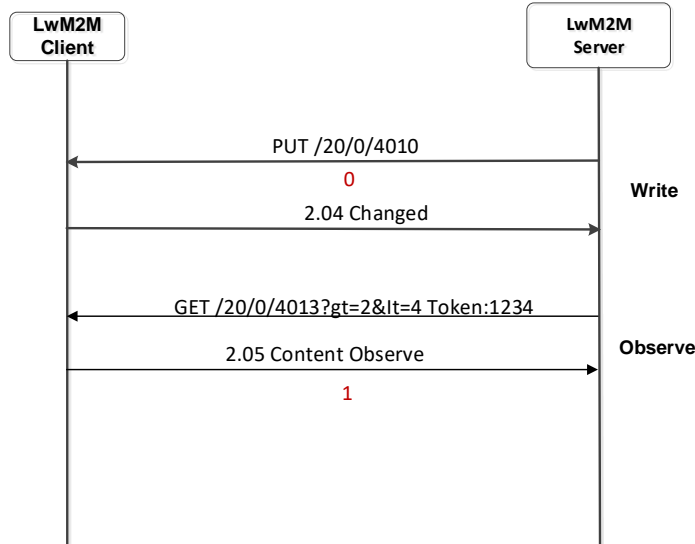


Figure 5: Data Collection Configuration sequence

- Active phase :
 - The Data Collection process is started with a period of 5 minutes (300 sec)
 - Some LogStatus notification take place for LwM2M Server Analysis
 - When Data Collection logging ends (period expires), the LwM2M Server can retrieve the LogData information (the data format is pre-configured between the Client and the Server)

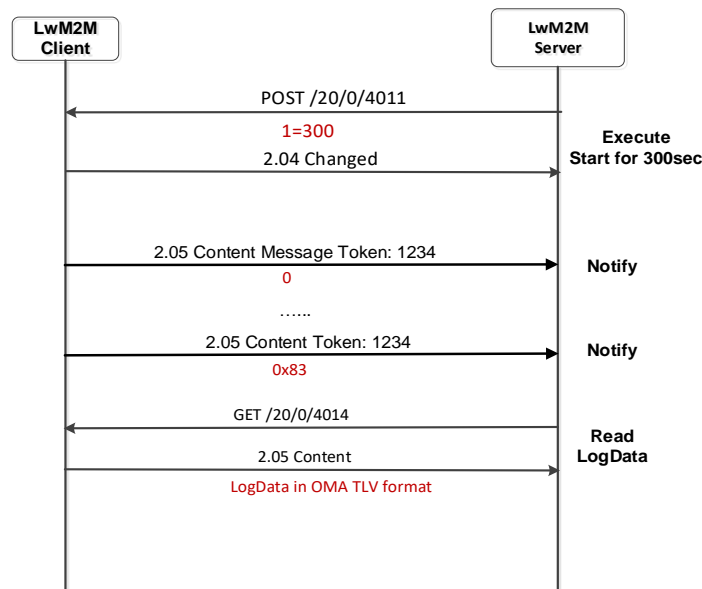


Figure 6: Data Collection Logging nominal sequence

Appendix A. Change History (Informative)

A.1 Approved Version History

| Reference | Date | Description |
|---------------------------------------|-------------|--|
| OMA-TS-LwM2M_EventLog-V1_0-20180615-A | 15 Jun 2018 | Status changed to Approved by DM Doc Ref # OMA-DM&SE-2018-0060- INP_LWM2M_EventLog_V1_0_ERP_for_final_Approval |

Appendix B. Example objects and resources (Informative)

| Object name | Object ID | Object Instance ID |
|------------------|-----------|--------------------|
| Event Log Object | 20 | 0 |

Table 1: Object Instances of the Example

| Resource Name | Resource ID | Resource Instance ID | Value | Notes |
|---------------|-------------|----------------------|---|--|
| LogClass | 4010 | | 0 | Generic log. |
| LogStatus | 4013 | | 3 | The log status is stopped and LogData contains Valid Data |
| LogDataFormat | 4015 | | 1 | OMA-LwM2M TLV format |
| LogData | 4014 | | 61-7C-E3-01-C1-11-00-00-05-00-60-18-18-18-0C-00-01-41-06-00-02-00-40-0C-00-00-00-00 | 4545> 2017/8/1 0:46:37.803 - NAS_DBG_TIMER: (00:00:31.685729): LAYER_NAS => LAYER_NAS: action: (TIMER_STOP), prim_id: (EMM_T3410_TIMER_EXPIRY_MSG), duration: 0x00 (0) |

Table 2: Event Log Object