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| ToR TF oneM2M\_2021 |
| Version: 0.2 |
| Autor: Miguel Angel Reina Ortega – Date:7 Jan 2021 |
| Last updated by: ETSI/Secretariat – Date:27 Jan 2021 |
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Terms of Reference – Task Force TF oneM2M\_2021 (oneM2M Partnership Project) Conformance testing for oneM2M specifications

Summary information

|  |  |  |  |
| --- | --- | --- | --- |
| Approval status | Approved by ETSI. Managed by ETSI/CTI | | **YES/NO** |
| Reference Body | oneM2M | | |
| ETSI Funding | **Maximum budget : 100 000 $ ETSI FWP (86 667 EUR)** | | |
| Minimum of 4 ETSI Members Support | **N/A** | | |
| Time scale | **From** | 2021-03-01 | |
| **To** | 2021-12-31 | |
| Work Items | TS-0018 (TS 118 118),  TS-0019 (TS 118 119) for Release 4 | | |
| TTF Roadmap reference |  | | |

Part I –TTF Technical Proposal

# Rationale & Objectives

## Rationale

oneM2M, the global standards initiative for M2M communications and the IoT, will publish a new set of oneM2M specifications (release 4). This release brings some new functionalities to oneM2M such as security enhancements (i.e. user/data privacy), service/user subscription, 3GPP Interworking, Fog/Edge Computing, semantic reasoning and ontology mapping. The new specifications will open up the IoT ecosystem to devices that lack the protocol and enable interworking among systems. Standardisation is key to achieving universally accepted specifications and protocols for true interoperability between IoT devices and applications.

oneM2M considers conformance testing as a key element in the success of oneM2M and therefore has initiated several work items for developing conformance test specifications.

ETSI CTI will continue supporting the oneM2M testing activities by bringing in the ETSI methodology, gained from many years of experience, being the centre of testing expertise in the area of M2M and Internet of Things (IoT) to support M2M services and applications.

ETSI CTI leading this conformance testing activity will ensure the quality of the oneM2M standards. The worldwide well-known ETSI methodology for developing high quality test specifications is a very important piece for the community to validate the conformity to the standards. With such conformity validation, companies will be confident to bring products to a mass market like IoT/M2M and thus make oneM2M a success.

The work of this TF proposal is to contribute to the development of test purposes and to develop TTCN-3 test suite on the oneM2M architecture and core protocol.

## Objectives of the work to be executed

The main objective of the present document is to define a project proposal for producing and maintaining a set of standardized conformance Abstract Test Suites (ATS) for oneM2M architecture and core protocol. The proposal includes also the development of test purposes prior the test cases implementation.

The produced test suites will be validated against implementations during a series of oneM2M Plugtests organized by ETSI which requires also the implementation of the test system composed of test adapter and codec systems. Although ETSI owns already such test system, some adaptation and extension are required for this TF to be able to validate the test suite.

In order to produce automatized and standardized test suites, test purposes need to be implemented in a specific testing language such as TTCN-3 and combined into an Abstract Test Suite (ATS). The test cases in the ATS are then validated against a number of Implementations Under Test (IUT) for correct operation according to some agreed procedures, before being released for use by the industry.

An Implementation eXtra Information for Test (IXIT) proforma associated to the ATS will also be produced complementing the test cases to help to perform conformance testing using oneM2M dedicated test equipment.

## Previous funded activities in the same domain

STF531 – conformance testing for oneM2M technology (release 1 and 2)

STF559 – conformance testing for oneM2M technology (release 3)

TF ONEM2M\_2020 – conformance testing for oneM2M technology (release 4)

## 

## Consequences if not agreed

Standardized IoT/M2M systems supporting oneM2M will be deployed in the European market and worldwide. Conformance testing will increase the level of confidence that equipment from various suppliers will interwork. This in turn will reduce implementation and rollout times. Not providing timely test specifications could compromise the quality of oneM2M equipment and ultimately delay their deployment.

The test suites produced by this TF will be used to prepare oneM2M products for deployment and interoperability within commercial oneM2M networks. Without such test suites the oneM2M entities interoperability cannot be guaranteed. Without the standardized abstract test suites, test platform vendors will inevitably interpret differently the oneM2M specifications which will, in turn, lead to variable results and general confusion as to what constitutes a conformant oneM2M product. Furthermore, the broader implementation of oneM2M networks could be delayed as potential issues, such as interoperability of devices, may not be resolved.

# ETSI Members Support

N/A

# Deliverables

## Base documents

|  |  |  |  |
| --- | --- | --- | --- |
| **Document** | **Title** | **Current Status** | **Expected date for stable document** |
| oneM2M TS-0001 | Functional Architecture | V4.7.0 | January 2021 |
| oneM2M TS-0004 | Service Layer Core Protocol Specification | V4.3.0 | January 2021 |
| oneM2M TS-0017 | Implementation Conformance Statements | V4.0.0 | Dec 2019 |
| oneM2M TS-0018 | Test Suite Structure & Test Purposes | V4.2.0 | Dec 2019 |
| oneM2M TS-0019 | Abstract Test suite | V4.0.0 | Dec 2019 |

## New deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **Deliv.** | **Work Item code**  **Standard number** | **Working title**  **Scope** | **Expected date of publication** |
| D1 | WI-0086  oneM2M TS-0019 rel-4  ETSI TS 118 119 v4 | Working title: Abstract Test Suite & Implementation eXtra Information for Test  Scope: conformance test suite  For release 4 | Dec 2021 |
| D2 | WI-0086  oneM2M TS-0018 rel-4  ETSI TS 118 118 v4 | Working title: Test Suite Structure & Test Purposes  For release 4 | Dec 2021 |

The following schedule applies to the WI created in oneM2M.

The work plan of the TS-0018 and TS-0019 for Release 4, which was initiated in January 2020 by TF-001, will be extended and be planned to be completed by TP#53. Therefore, the TF is in line with the work on these specifications.

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| --- | --- | --- | --- | --- | --- | --- |
| **Document**  **Type** | **Document**  **Number\*** | **Title** | **Schedule (TP No.)** | | | |
| **Start** | **Change Control** | **Freeze** | **Approval** |
| TS | TS-0019 | Abstract Test Suite and Implementation eXtra Information for Test  For Release 4 | TP38  (3-7 Dec 2018) | TP46  (July 2020) | TP52  (August 2021) | TP53  (December 2021) |
| TS | TS-0018 | Test Suite Structure & Test Purposes  For Release 4 | TP38  (3-7 Dec 2018) | TP46  (July 2020) | TP52  (August 2021) | TP53  (December 2021) |

# Maximum budget

## Task summary/Manpower Budget

|  |  |
| --- | --- |
| **Description** | **Maximum estimated cost (USD)** |
| Manpower | 100 000 |

|  |  |  |
| --- | --- | --- |
| **Task short description** | Budget (EUR) | *Budget (USD)* |
| Project management and code review | 21 667 | *25 000* |
| Implementation of test purposes | 34 667 | *40 000* |
| Implementation of TTCN-3 test cases | 24 267 | *28 000* |
| Enhancement and adaptation of test system | 3 466 | *4 000* |
| Validation of TTCN-3 test cases | 2 600 | *3 000* |
| **TOTAL** | **65 000** | *100 000* |

The project management and code review will be managed by the ETSI CTI

## Travel budget

N/A

## Other budget line

N/A

Part II – Details on TTF Technical Proposal

# Tasks, Technical Bodies and other stakeholders

## Organization of the work

The TF will be under the monitoring and responsibility of oneM2M TDE, working together with the ETSI CTI (Centre for Testing and Interoperability).

Working sessions will in principle take place at ETSI premises unless otherwise agreed among ETSI CTI leadership and recruited experts.

The TF will provide regular reports to the oneM2M TDE working group. Conference calls may be held when appropriate. Face-to-face meetings will occur in connection with the Working Group meetings.

## Other interested ETSI Technical Bodies

N/A

## Other stakeholders

N/A

Part III: Execution of Work

# Work plan, time scale and resources

## Task description

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| --- | --- |
| **Task 1** | **Project Management and Code Review** |
| **Objectives** | Project Management and TTCN-3 Code Review |
| **Input** | N/A |
| **Output** | Professional project management and high quality of the specifications produced |
| **Interactions** | oneM2M TDE WG – Prioritization of the tests to be implemented and verification of the produced test cases |
| **Resources required** | * good knowledge of relevant oneM2M standards; * expert knowledge in writing ATS test specifications; * expert knowledge of TTCN-3; * expert experience of conformance and interoperability testing; * expert knowledge of software engineering and validation techniques; * good knowledge of relevant oneM2M equipment |

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| **Task 2** | **Test Purposes** |
| **Objectives** | Implementation and maintenance of test purposes for TS-0001 and TS-0004 |
| **Input** | TS-0001, TS-0004, TS-0017 |
| **Output** | Set of Test Purposes for TS-0001 and TS-0004 in form of oneM2M contributions |
| **Interactions** | oneM2M TDE WG – Prioritization of the test purposes to be implemented |
| **Resources required** | * good knowledge of relevant oneM2M standards; * expert knowledge in writing conformance test specifications; * expert experience of conformance testing; |

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| **Task 3** | **ATS** |
| **Objectives** | Implementation and maintenance of TTCN-3 test suite for TS-0018 |
| **Input** | TS-0017, TS-0018 |
| **Output** | Set of TTCN-3 test cases implementing the Test Purposes provided by oneM2M TDE WG in TS-0018 in terms of oneM2M contributions |
| **Interactions** | oneM2M TDE WG – Prioritization of the tests to be implemented and verification of the produced test cases |
| **Resources required** | * good knowledge of relevant oneM2M standards; * expert knowledge in writing ATS test specifications; * expert knowledge of TTCN-3; * expert experience of conformance testing; |

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| **Task 4** | **Test System Implementation** |
| **Objectives** | Enhancement and adaption of test adapter and codec systems for the validation of the ATS |
| **Input** | TS-0019 |
| **Output** | Test adapter and codec for oneM2M ATS |
| **Interactions** | ETSI CTI – Prioritization of the modules to be implemented |
| **Resources required** | * expert knowledge of TTCN-3; * expert knowledge in Java; * expert experience of conformance and interoperability testing; * expert knowledge of software engineering and validation techniques; * good knowledge of relevant oneM2M equipment |

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| **Task 5** | **Validation** |
| **Objectives** | Validation of the TTCN-3 test suites |
| **Input** | TS-0019 |
| **Output** | Validation of TTCN-3 test cases |
| **Interactions** | oneM2M implementation vendors |
| **Resources required** | * good knowledge of relevant oneM2M standards; * expert knowledge in writing ATS test specifications; * expert knowledge of TTCN-3; * expert knowledge of software engineering and validation techniques; * good knowledge of relevant oneM2M equipment |

## Milestones

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| A | TF Official announcement | 02-2021 |
| B | First wave of first drafts of test purposes | 04-2021 |
| C | Stable drafts of first wave of test purposes and test cases | 07-2021 |
| D | Second wave of first drafts of test purposes | 09-2021 |
| E | Stable drafts of second wave test purposes and test cases | 12-2021 |
| **Total** | |  |

## Task summary

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Code** | **Task / Milestone** | **Target date** | | **Estimated cost** | | |
| **From** | **To** | **USD** | **EUR** | **CTI Days** |
| A | Start of work | 01 Mar 2021 |  |  |  |  |
| T1 | Project management and code review | 01-03-2021 | 12-04-2021 |  |  | 4 |
| T2 | Implementation and maintenance of test purposes | 01-03-2021 | 12-04-2021 | 10000 | 8 667 |  |
| T3 | Maintenance of TTCN-3 test cases | 01-03-2021 | 12-04-2021 | 4000 | 3 467 |  |
| T4 | Enhancement and adaptation of test system | 01-03-2021 | 12-04-2021 | 1000 | 866 |  |
| T5 | Validation | 01-03-2021 | 12-04-2021 |  |  | 4 |
| B | First wave of first drafts of test purposes | 12-04-2021 |  |  |  |  |
| T1 | Project management and code review | 16-04-2021 | 28-06-2021 |  |  | 6 |
| T2 | Implementation and maintenance of test purposes | 16-04-2021 | 28-06-2021 | 10000 | 8 667 |  |
| T3 | Implementation of TTCN-3 test cases | 16-04-2021 | 28-06-2021 | 10000 | 8 667 |  |
| T4 | Enhancement and adaptation of test system | 16-04-2021 | 28-06-2021 | 1000 | 866 |  |
| T5 | Validation | 16-04-2021 | 28-06-2021 | 1500 | 1 300 | 6 |
| C | Stable drafts of first wave of test purposes and test cases | 28-06-2021 |  |  |  |  |
| T1 | Project management and code review | 02-07-2021 | 30-08-2021 |  |  | 4 |
| T2 | Implementation and maintenance of test purposes | 02-07-2021 | 30-08-2021 | 10000 | 8 667 |  |
| T3 | Maintenance of TTCN-3 test cases | 02-07-2021 | 30-08-2021 | 4000 | 3 467 |  |
| T4 | Enhancement and adaptation of test system | 02-07-2021 | 30-08-2021 | 1000 | 866 |  |
| T5 | Validation | 02-07-2021 | 30-08-2021 |  |  | 4 |
| D | Second wave of first drafts of test purposes | 30-08-2021 |  |  |  |  |
| T1 | Project management and code review | 03-09-2021 | 29-11-2021 |  |  | 6 |
| T2 | Implementation and maintenance of test purposes | 03-09-2021 | 29-11-2021 | 10000 | 8 667 |  |
| T3 | Implementation of TTCN-3 test cases | 03-09-2021 | 29-11-2021 | 10000 | 8 667 |  |
| T4 | Enhancement and adaptation of test system | 03-09-2021 | 29-11-2021 | 1000 | 866 |  |
| T5 | Validation | 03-09-2021 | 29-11-2021 | 1500 | 1 300 | 6 |
| E | Stable drafts of second wave test purposes and test cases | 29-11-2021 |  |  |  |  |
| **Totall** | | |  | **75 000** | **65 000** | **40**  **(25 000 USD / 21 667 EUR)** |

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| **Task Milest.** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |
| T1 |  |  |  |  |  |  |  |  |  |  |
| T2 |  |  |  |  |  |  |  |  |  |  |
| T3 |  |  |  |  |  |  |  |  |  |  |
| T4 |  |  |  |  |  |  |  |  |  |  |
| T5 |  |  |  |  |  |  |  |  |  |  |
| M1 |  |  |  |  |  |  |  |  |  |  |
| M2 |  |  |  |  |  |  |  |  |  |  |
| M3 |  |  |  |  |  |  |  |  |  |  |
| M4 |  |  |  |  |  |  |  |  |  |  |

# Expertise required

## Team structure

Up to 3 participants to ensure the following mix of competences:

|  |  |
| --- | --- |
| **Priority** | **Qualifications and competences** |
| Medium | good knowledge of relevant oneM2M standards; |
| High | expert knowledge in writing ATS test specifications; |
| High | expert knowledge of TTCN-3; |
| High | expert knowledge of Java for TTCN-3 test adapter and codec; |
| High | expert experience of conformance and interoperability testing; |
| High | expert knowledge of software engineering and validation techniques; |
| Medium | good knowledge of relevant oneM2M equipment |

The TF will be selected and recruited following the agreed ETSI procedures. The oneM2M TF experts will be recruited following the issuing of an ETSI Collective Letter and this will also be available from the ETSI STF page on the ETSI Portal via the ETSI website.

Part IV: TTF performance evaluation criteria

# Performance Indicators

|  |  |
| --- | --- |
| **Select relevant Performance indicators applicable for these ToR (X)** | |
| Contribution from ETSI Members to TTF work | |
| Direct financial contribution (co-funding) |  |
| Support to the TTF work (e.g., provision of test–beds, organization of workshops, events) | X |
| Steering Group meetings (number of meetings / participants / duration) | X |
| Number of delegates directly involved in the review of the deliverables | X |
| Contributions/comments received from the Reference Bodies | X |
| Contributions/comments received from other Reference Bodies | X |
|  |  |
| **Contribution from the TTF to ETSI work** | |
| Contributions to Reference Body meetings (number of documents / meetings / participants) | X |
| Contributions to other Reference Bodies |  |
| Presentations in workshops, conferences, stakeholder meetings | X |
|  |  |
| **Liaison with other stakeholders** | |
| Stakeholder participation in the project (category, business area) |  |
| Cooperation with other standardization bodies | X |
| Potential interest of new members to join ETSI | X |
| Liaison to identify requirements and raise awareness on ETSI deliverables | X |
| Comments received on drafts (e.g. on WEB site, mailing lists, etc.) | X |
|  |  |
| **Quality of deliverables** | |
| Approval of deliverables according to schedule | X |
| Respect of time scale, with reference to start/end dates in the approved ToR | X |
| Comments from Quality review by Reference Body | X |
| Comments from Quality review by ETSI Secretariat | X |
|  |  |

# Document history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.1 | 2021-01-07 | Miguel Angel Reina Ortega | ETSI approved |  |
| 0.2 | 2021-01-27 | ETSI/Funded Activities | ETSI approved | Comments before CL publication |