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| ETSI_logo_Office_Colour_Small | ToR STF 531 (TC SmartM2M) |
| Version: 0.6 |
| Author: Laurent Velez – Date:12 Oct 2016 |
| Last updated by: ETSI Secretariat/CTI – Date:13 March 2017 |
| page 1 of 4 |

Terms of Reference - Specialist Task Force

STF 531 (TC SmartM2M)

SmartM2M conformance testing for oneM2M specifications

Summary information

|  |  |
| --- | --- |
| Approval status | Under approval by correspondence by TC SmartM2M, ending 27-Oct  (doc ref: SmartM2M(16)040001r2). Approved by Board#110 |
| Funding | **Maximum budget: 130 000 € ETSI FWP** |
| Time scale | Mar 2017 to Jun 2018 (TB approval final deliverables) |
| Work Items | TS-0019 ( TS 118 119) and TS-0029 (TS 118 129)  NOTE: WIs to be revised in line with outcome of preparatory meeting. |
| Board priority | [ETSI STF funding criteria](http://portal.etsi.org/stfs/process/item2_PropApprFund/item2_A1_FundCriteria.asp)  Horizontal activities (Conformance Testing) in innovative domain for ETSI |

Part I – Reason for proposing the STF

# Rationale

oneM2M, the global standards initiative for M2M communications and the IoT, has just published its new set of oneM2M specifications (release 2). This release is a major improvement of the oneM2M’s initial set of specifications, which were designed to enable basic connectivity between applications and devices. 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.

Security has also been particularly addressed in this release 2 by enabling end-to-end secure information exchange between any devices or servers, as well as implementing dynamic access control. Security is crucial for IoT/M2M considering this mass market will address multibillion devices that must be protected from intrusions and interference that could compromise personal privacy or threaten public safety.

oneM2M considers testing as a key element in the success of oneM2M and therefore has initiated two work items for developing conformance test specifications, one on the oneM2M architecture and core protocol, and one dedicated to security.

TC SmartM2M has a strong interest to support these two oneM2M testing activities by bringing in the ETSI methodology, gained from many years of experiences. It reinforces the role of TC SmartM2M to be a centre of expertise in the area of M2M and Internet of Things (IoT) to support M2M services and applications, acting here as the European arm of the oneM2M partnership project.

TC SmartM2M 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 in order 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 success.

The work of this STF proposal is to develop two TTCN-3 test suites on the oneM2M architecture/core protocol and on security.

Regarding resources, TC SmartM2M cannot rely on only voluntary efforts for a continuous, rapid and efficient test suite development. There is a high expectation and pressure from market to release test specifications along with every release, and for the sake of efficiency, funding is required.

# Objective

The 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 and for security.

The produced test suites will be then be validated against implementations during a series of oneM2M Plugtests organized by ETSI.

oneM2M WG TST is in charge of developing test purposes in natural language for oneM2M architecture/protocol and security requirements..

In order to produce automatized and standardized test suites, those 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.

# Relation with ETSI strategy and priorities

The proposed conformance testing activities and this STF are directly related and in line with the two ETSI Boards categories “Horizontal activities (quality, security, etc.)” and “Standards enablers/facilitators (conformance testing, interoperability, methodology)”.

# Context of the proposal

## ETSI Members support

|  |  |  |
| --- | --- | --- |
| **ETSI Member** | **Supporting delegate** | **Motivation** |
| Telecom Italia | Enrico SCARRONE |  |
| Nokia | Omar ELLOUMI |  |
| Huawei | Francisco Da Silva |  |
| Gemalto | Francois Ennesser |  |
| Sensinov | Mahdi ben Alaya |  |
| EGM | Franck Legall |  |
| Spirent | Richard Catmur |  |
| TNO | Laura Daniele |  |
| InterDigital | Dale Seed |  |
| LAAS-CNRS | Thierry Monteil |  |
| AMB Consulting | Alexandre Berge |  |
| AT4Wireless | Rosario Trapero |  |
| Fraunhofer Fokus | Axel Rennoch |  |
| Qualcomm UK | Josef Blanz |  |
| Sierra Wireless | Nicolas Damour |  |
| STMicroelectronics | Joel Huloux |  |
| Deutsche Telekom | Roland Hechwartner |  |

## Market impact

The availability of reliable and validated test specifications will allow implementers of oneM2M to test the conformity of their products against the specifications. The conformance testing during the whole development phase of all oneM2M products will significantly reduce their time-to-market. It will enhance quality level and will hence be less likely to cause interoperability problems with the products of other vendors.

The overall deployment of oneM2M equipment will directly lead to a quick adoption of the related M2M standards from ETSI and oneM2M. These standards address a multi-billion products market.

## Tasks for which the STF support is necessary

The TC SmartM2M/oneM2M members do not have sufficient resources and skills to develop TTCN-3 conformance test suites on time, and with the required high quality that only the use of the ETSI recommended methodology may bring. The technical competence required to implement this methodology can only be achieved by an STF.

Experience with the development of other testing standards has shown that involvement of experts on conformance testing requires highly specialized knowledge in testing methodology, TTCN-3 language and dedicated tools. There is an advantage if testing experts are disjoint from experts developing the protocol specifications. In addition, the development of this kind of specifications requires significant effort and it cannot be expected that this effort can be provided on a voluntary basis. Hence the involvement of testing experts is needed in order to assure timely completion and high quality test specifications. These TTCN-3 testing experts are not available in oneM2M community and need to be recruited on a funded basis. The experts will use dedicated software tools available at ETSI.

There is a high expectation and pressure from market to release test specifications along with every release, which cannot rely on only voluntary contributions

## Related voluntary activities in the TB

The TC SmartM2M and the oneM2M ETSI members supporting the creation of the STF are committed to supporting this STF in terms of participation in the STF Steering Group, providing input and review to the STF.

## Previous funded activities in the same domain

NA

## 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 STF 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.

Part II - Execution of the work

# Technical Bodies and other stakeholders

## Reference TB

TC SmartM2M will be the TB responsible for the technical guidance of the STF.

## Other interested ETSI Technical Bodies

* oneM2M Partnership Project

## Other stakeholders

NA

# Base documents and deliverables

## Base documents

|  |  |  |  |
| --- | --- | --- | --- |
| Document | Title | **Current Status** | **Expected date for stable document** |
| oneM2M TS-0001 | Functional Architecture | v2.12 | - |
| oneM2M TS-0003 | Security Solutions | V2.4.1 | - |
| oneM2M TS-0004 | Service Layer Core Protocol Specification | V2.9 | - |
| oneM2M TS-0017 | Implementation Conformance Statements | Draft |  |
| oneM2M TS-0018 | Test Suite Structure & Test Purposes | Draft |  |
| oneM2M TS-0027 | Security Implementation Conformance Statements | Draft |  |
| oneM2M TS-0028 | Security Test Suite Structure & Test Purposes | Draft |  |

## Deliverables

|  |  |  |
| --- | --- | --- |
| **Deliv.** | **Work Item code**  **Standard number** | **Working title**  **Scope** |
| D1 | WI-0032  oneM2M TS-0019 (see Note)  DTS/oneM2M-000019  ETSI TS 118 119 | Working title: Abstract Test Suite & Implementation eXtra Information for Test  Scope: conformance test suite |
| D2 | WI-0051  oneM2M TS-0029  DTS/oneM2M-000029  ETSI TS 118 129 | Working title: Security Abstract Test Suite & Implementation eXtra Information for Test  Scope: Security conformance test suite |

NOTE: The WI TS0019 is an item that covers only Release 1. A new work item will be created that also covers Release 2 which this activity will deal with. This item will be updated when provided.

## Deliverables schedule:

The following schedule applies to the 2 WI created in oneM2M.

The work for TS-0019 was meant to be completed in TP#26 but the TS is still an early draft due to lack of expertise in TTCN-3 and testing methodology in oneM2M Technical Committee. It reinforces the crucial need of this STF led by TC SmartM2M.

The work plan of the TS-0019 and TS-0029 will be extended to continue beyond release 2. Therefore the STF is perfectly in line with the work on these specifications.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 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 | TP19  (7-11 Sept 2015) | TP23  16-20 May 2016) | TP24  (18-22 July 2016) | TP29  (22-26 May 2017) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Document  Type | Document  Number\* | Title | Schedule (TP No.) | | | |
| Start | Change Control | Freeze | Approval |
| TS | TS-0029 | Security Abstract Test Suite and Implementation eXtra Information for Test | TP25  (17-21 oct 2016) | TP28  (27-31 March 2017) | TP29  (22-26 May 2017) | TP30 (10-14 July 2017) |

# Work plan, time scale and resources

## Organization of the work

The STF will be under the monitoring and responsibility of TC SmartM2M, working with and under the quality control of the ETSI CTI (Centre for Testing and Interoperability).

A Steering Group (SG) will be formed comprising members of ETSI TC SmartM2M, oneM2M WG TST and stakeholders from the organisations mentioned in section 4 of this proposal. The SG will be set up and jointly led by the chairs and the vice-chair of TC SmartM2M.

The STF will provide regular reports to the Steering Group. Conference calls will be held when appropriate. Face-to-face meetings will occur in connection with the relevant TC meetings and Working Group meetings.

Most of the working sessions will be held in ETSI premises. The travel costs incurred for working sessions in ETSI will be part of the service contract and not funded by the travel budget.

## Task description

Task 1 – Project Management and Code Review

Objectives: Project Management and TTCN-3 Code Review

Input

Output: Professional project management and high quality of the specifications produced

**Interactions**: TC SmartM2M – oneM2M TST WG – Prioritization of the tests to be implemented and verification of the produced test cases

This task is under the responsibility of ETSI CTI.

Task 2 – ATS

Objectives: Implementation 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 TST WG in TS-0018

**Interactions**: TC SmartM2M – oneM2M TST 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;

Task 3 – Security ATS

Objectives: Implementation of TTCN-3 test suite for TS-0028

Input: TS-0027, TS-0028

Output: Set of TTCN-3 test cases implementing the Test Purposes provided by oneM2M TST WG in TS-0028

**Interactions**: TC SmartM2M – oneM2M TST 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;

Task 4 – Validation

Objectives: Validation of the TTCN-3 test suites

Input: TS-0019, TS-0029

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Mil.** | **Description** | **Target date** | **Meeting** | **Remarks** |
| M0 | STF Preparatory Meeting | 02-2017 | SmartM2M#41 – Sophia Antipolis 28 Feb – 2 Mar |  |
| M1 | Progress report approval & first drafts of test cases for TS-0019 and TS-0029 available | 06-2017 | SmartM2M#42 – Italy 12-14 Jun |  |
| M2 | Progress report approval & validation of first drafts of test cases for TS-0019 and TS-0029 in Plugtests available | 09-2017 | SmartM2M#43 – Sophia Antipolis 06-08 Sep |  |
| M3 | Progress report approval & early drafts of test cases for TS-0019 and TS-0029 available | 11-2017 | SmartM2M#44 – TBC |  |
| M4 | Progress report approval & validation of early drafts of test cases for TS-0019 and TS-0029 in Plugtests available | 03-2018 | SmartM2M#45 – TBC |  |
| M5 | Progress report approval following handling of comments from OneM2M in July stable drafts of tests cases for TS-0019 and TS-0029 for June M2M meeting | 07-2014 | Smart M2M#46 & response from One M2M (July 2018) | No payment |
| M6 | Final report approval & stable drafts of test cases for TS-0019 and TS-0029 available | 09-2018 | SmartM2M#47 – TBC |  |
| **Total** | |  |  |  |

## Task summary

|  |  |  |  |
| --- | --- | --- | --- |
| **N** | **Task / Milestone / Deliverable** | Target date | Estimated % Effort |
| M0a | Preparatory Meeting | 28 Feb 2017 |  |
| M0b | Start of work | 15 Apr 2017 |  |
| T1 | Project management and code review | From 15-04-2017  to 31-07-2018 |  |
| T2 | Implementation of TTCN-3 test cases for TS-0018 | From 15-04-2017  to 15-09-2018 | 60% |
| T3 | Implementation of TTCN-3 test cases for TS-0028 | From 15-04-2017  to 15-09-2018 | 15% |
| M1 | Progress report approval & First drafts of test cases for TS-0019 and TS-0029 available. | 06-2017 |  |
| M2 | Progress report approval & validation of first drafts of test cases for TS-0019 and TS-0029 in Plugtests available | 09-2017 |  |
| T4 | Validation | From 01-09-2017  to 15-09-2018 | 20% |
| M3 | Progress report approval & early drafts of test cases for TS-0019 and TS-0029 available | 11-2017 |  |
| M4 | Progress report approval & validation of early drafts of test cases for TS-0019 and TS-0029 in Plugtests available | 02-2018 |  |
| M5 | Progress report approval & validation of early drafts of test cases for TS-0019 and TS-0029 available | 06-2018 |  |
| M5 | Final report approval covering total activity & stable drafts of test cases for TS-0019 and TS-0029 submitted to OneM2M | 06-2018 | 5% |
| **Total** | | |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task Milest.** | Description | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** |
| T1 | Project management and code review |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T2 | Implementation of TTCN-3 test cases for TS-0018 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T3 | Implementation of TTCN-3 test cases for TS-0028 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T4 | Validation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M1 | Progress report approval & First drafts of test cases for TS-0019 and TS-0029 available. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M2 | Progress report approval & validation of first drafts of test cases for TS-0019 and TS-0029 in Plugtests available |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M3 | Progress report approval & early drafts of test cases for TS-0019 and TS-0029 available |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M4 | Progress report approval & validation of early drafts of test cases for TS-0019 and TS-0029 in Plugtests available |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M5 | Progress report approval & stable drafts of test cases for TS-0019 and TS-0029 available |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M6 | Final Report approval covering total activity & stable drafts of test cases for TS-0019 and TS-0029 submitted to OneM2M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## Working methods and travel cost

The STF (Specialist Task Force) under the monitoring and responsibility of TC SmartM2M, working with and under quality control of the ETSI CTI (Centre for Testing and Interoperability).

A Steering Group (SG) will be formed comprising members of oneM2M WG TST, ETSI TC SmartM2M and stakeholders from the organisations mentioned in section 4 of this proposal. This also includes candidate organisations who were not selected for this STF but who wish to follow the work and provide guidance on a voluntary basis. The SG will be set up and jointly led by the chairs and the vice-chair of oneM2M WG TST.

The STF will provide regular reports to the Steering Group. Conference calls will be held when appropriate. Face-to-face meetings will occur in connection with the relevant TC meetings and Working Group meetings.

The total action cost includes the travels required to attend the following events:

* Two or three STF representatives to a test site to support an interoperability event (expected duration of approximately five days). (~2 Plugtests expected)
* Present STF Progress Report and deliverables to TC SmartM2M meetings (5 meetings)
* Synchronization with oneM2M TST WG during TP meetings (4 meetings)

|  |  |  |
| --- | --- | --- |
| **Travel** | **Number** | **Cost estimate** |
| Events | Up to 3 | 6 000 € |
| Meetings | 9 | 10 000 € |
| **Total** |  | **16 000 €** |

# Expertise required

## Team structure

Up to 4 participants to ensure the following mix of competences:

* 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

The STF will be selected and recruited following the agreed ETSI procedures. The ETSI STF 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 III: Financial conditions

# Maximum budget

## Manpower cost

|  |  |
| --- | --- |
| **Description** | **Maximum estimated cost (€)** |
| Service contracts | 114 000 |

## Travel cost

|  |  |
| --- | --- |
| **Expected travels** | **Cost estimate** |
| Participation in up to 3 Plugtests to validate the TTCN-3 test suites | 6 000 |
| Participation to 5 meetings (only those out of Europe) for reporting to stakeholders | 10 000 |
| **Total cost** | **16 000** |

## Other Costs

NA

Part IV: STF performance evaluation criteria

# Key Performance Indicators

Contribution from ETSI Members to STF work

* Direct financial contribution (co-funding)
* Support to the STF work (e.g., provision of test–beds, organization of workshops, events)
* Steering Group meetings (number of meetings / participants / duration)
* Number of delegates directly involved in the review of the deliverables
* Contributions/comments received from the reference TBs
* Contributions/comments received from other TBs

Contribution from the STF to ETSI work

* Contributions to TC/WG meetings (number of documents / meetings / participants)
* Contributions to other TBs
* Presentations in workshops, conferences, stakeholder meetings

Liaison with other stakeholders

* Stakeholder participation in the project (category, business area)
* Cooperation with other standardization bodies
* Potential interest of new members to join ETSI
* Liaison to identify requirements and raise awareness on ETSI deliverables
* Comments received on drafts (e.g. on WEB site, mailing lists, etc.)

Quality of deliverables

* Approval of deliverables according to schedule
* Respect of time scale, with reference to start/end dates in the approved ToR
* Comments from Quality review by TB
* Comments from Quality review by ETSI Secretariat

Time recording

For reporting purposes the STF experts shall fill in the time sheet provided by ETSI with the days spent for the performance of the services

In the course of the activity, the STF Leader will collect the relevant information, as necessary to measure the performance indicators. The result will be presented in the Final Report.

# Document history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.1 | 11-Oct-2016 | Laurent Velez |  | Initial draft |
| 0.2 | 12-Oct-2016 | Laurent Velez |  | Updated the document using the latest ToR template |
| 0.3 |  | Berrini |  | Additional support members |
| 0.4 | 12-Dec-16 | Y. Sakho | Board #110 Approved | Editorials |
| 0.5 | 13-Dec-16 | CTI | Board #110 Approved | Editorials |
| 0.6 | 27-Feb-16 | G. Craik |  | Editorials from review at STF Preparatory Meeting |