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| ETSI_logo_Office_Colour_Small | ToR STF CN (TC SmartM2M) |
| Version: 0.3 |
| Author: Miguel Angel Reina Ortega – Date:20 Mar 2018  |
| Last updated by: Youssouf Sakho – Date:09 July 2018 |
| page 1 of 12 |

Terms of Reference - Specialist Task Force

STF CN (TC SmartM2M)

SmartM2M conformance testing for oneM2M specifications

Summary information

|  |  |
| --- | --- |
| Approval status | Approved by TC SmartM2M by RC on 15th May(doc ref: SmartM2M(18)046002)Approved by Board#118 (20 June 2018) |
| Funding | **Maximum budget: 150 000 € (105 K€ ETSI FWP + 45 K€ CTI voluntary and oneM2M partners contribution)** |
| Time scale | Oct 2018 to Dec 2019 (TB approval final deliverables) |
| Work Items  | TS-0018 (TS 118 118), TS-0019 (TS 118 119) |
| Board priority  | [ETSI STF funding criteria](http://portal.etsi.org/stfs/process/item2_PropApprFund/item2_A1_FundCriteria.asp) |

Part I – Reason for proposing the STF

# Rationale

oneM2M, the global standards initiative for M2M communications and the IoT, will publish a new set of oneM2M specifications (release 3 and release 4). These releases bring some new functionalities to oneM2M such as enhanced security (i.e. dynamic authorization, secure environment abstraction), industry domain enablement, interworking framework (i.e. 3GPP SCEF, OPC-UA), semantic analysis improvement (i.e. mashups, querying). 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 testing as a key element in the success of oneM2M and therefore has initiated several work items for developing conformance test specifications.

TC SmartM2M has a strong interest to continue supporting the oneM2M testing activities by bringing in the ETSI methodology, gained from many years of experience. 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 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 STF proposal is to contribute to the development of test purposes and to develop TTCN-3 test suite on the oneM2M architecture and core protocol.

Regarding resources, TC SmartM2M cannot rely on only voluntary efforts for a continuous, rapid and efficient test purpose and 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 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 is required for this STF to be able to validate the test suite.

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)”.

One of the main activities of TC SmartM2M is to be a centre of expertise in the area of M2M and Internet of Things (IoT) to support M2M services and applications as well as to undertake the necessary work that cannot be provided by oneM2M.

The proposal is also in line with the ETSI position recently reconfirmed at the last oneM2M Steering Committee to support the oneM2M adoption activities carried over by the oneM2M community which includes among others the development of standardized conformance test specifications.

# Context of the proposal

## ETSI Members support

|  |  |  |
| --- | --- | --- |
| **ETSI Member** | **Supporting delegate** | **Motivation** |
| EGM | Franck Le Gall | We see such an activity necessary to go on providing oneM2M with highly professional conformance tests which will also contribute to the development of the oneM2M certification program. Such a program will be a key differentiator in oneM2M market adoption and will benefit from the ETSI expertise on standardised tests development. |
| Sensinov | Mahdi Ben Alaya | We see conformance test specifications as a pillar for oneM2M success. |
| Huawei Technologies Sweden AB | Francisco Da Silva | Our company interest in this STF is to guarantee the continuation of the work of the necessary oneM2M test specifications including for certification purposes, a key issue for oneM2M success in the market |
| DEKRA Testing and Certification, S.A.U. | Diego Bartolome | In DEKRA, we fully support oneM2M activities as we consider this technology a key player in the IoT arena. In fact, DEKRA Certification Japan has been recently nominated by TTA as oneM2M Authorized Test Lab and we are following very closely the migration process under the GCF umbrella. We are also considering start working on a oneM2M Conformance Test Tool to be validated in a next GCF Validation process |
| Fraunhofer FOKUS | Axel Rennoch | FOKUS is interested to integrate the oneM2M tests in our IoT test lab and to apply them in the context of research projects and industrial services |
| Spirent | Bogdan Stanca-Kaposta |  |
| Interdigital | Dale Seed | The work that ETSI STF is doing is extremely important to the success of the oneM2M certification program and ecosystem.  Without ETSI STF oneM2M conformance testing just will not happen.  For this reason, I’d like to express strong support on behalf of Convida and InterDigital which I hope the ETSI Board will take into consideration when reviewing the ETSI STF proposal. |
| Deutsche Telekom | Roland Hechwartner | oneM2M provides the basis for a global, standard based IoT ecosystem. Conformance testing is of utmost importance for the TTM. Deutsche Telekom supports this STF for producing and maintaining a set of standardized conformance Abstract Test Suites (ATS) for oneM2M architecture and core protocol, including also the development of test purposes prior to the test cases implementation. |
| Qualcomm | Josef Blanz | While oneM2M specifications (core specs, protocol bindings, interworking) are getting more mature and while Rel-3 is getting ready, one of the biggest hurdles to create more market traction is a technically sound way of defining a testing framework, which can be used by external certification programs. In order to cover more features and more recent releases (Rel-2 & 3) in the set of test specifications – in particular the abstract test suites – it is essential to further progress this STF activity. For a chipset vendor like Qualcomm, robust and complete test specifications – and based on that – the enablement of external certification program(s) are pre-requisites to justify implementation of oneM2M at a larger scale |

## 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.

In addition, as decided at the last oneM2M Steering Committee meeting, a financial contribution (reflected already in the requested budget) from partners for this project is expected to be included in the 2019 oneM2M budget.

## Previous funded activities in the same domain

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

## 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 | V3.10.0 | July 2018 |
| oneM2M TS-0004 | Service Layer Core Protocol Specification | V3.7.0 | July 2018 |
| oneM2M TS-0017 | Implementation Conformance Statements  | V2.0.0 | Sep 2018 |
| oneM2M TS-0018 | Test Suite Structure & Test Purposes | V2.2.0 | Sep 2018 |
| oneM2M TS-0019 | Abstract Test suite  | V2.0.0 | Sep 2018 |

## Deliverables

|  |  |  |
| --- | --- | --- |
| **Deliv.** | **Work Item code****Standard number** | **Working title****Scope** |
| D1 | WI-0085oneM2M TS-0019 rel-3ETSI TS 118 119 v3 | Working title: Abstract Test Suite & Implementation eXtra Information for TestScope: conformance test suiteFor release 3 |
| D2 | WI-0085oneM2M TS-0018 rel-3ETSI TS 118 118 v3 | Working title: Test Suite Structure & Test PurposesFor release 3 |
| D3 | WI-0086oneM2M TS-0019 rel-4ETSI TS 118 119 v4 | Working title: Abstract Test Suite & Implementation eXtra Information for TestScope: conformance test suiteFor release 4 |
| D4 | WI-0086oneM2M TS-0018 rel-4ETSI TS 118 118 v4 | Working title: Test Suite Structure & Test PurposesFor release 4 |

## Deliverables schedule:

The following schedule applies to the WI created in oneM2M.

The work for TS-0019 for release 2 is planned to be completed in TP#37 by STF531.

The work plan of the TS-0018 and TS-0019 will be extended to continue beyond release 2. Therefore, the STF is perfectly in line with the work on these specifications.

|  |  |  |  |
| --- | --- | --- | --- |
| DocumentType | DocumentNumber\* | Title | Schedule (TP No.) |
| Start  | Change Control  | Freeze | Approval |
| TS | TS-0019 | Abstract Test Suite and Implementation eXtra Information for TestFor Release 3 | TP35(22-25 May 2018) | TP39(January 2019) | TP40(March 2019) | TP41(May 2019) |
| TS | TS-0018 | Test Suite Structure & Test PurposesFor Release 3 | TP35(22-25 May 2018) | TP39(January 2019) | TP40(March 2019) | TP41(May 2019) |
| TS | TS-0019 | Abstract Test Suite and Implementation eXtra Information for TestFor Release 4 | TP38(3-7 Dec 2018) | TP43(September 2019) | TP44(December 2019) | TP45(January 2020) |
| TS | TS-0018 | Test Suite Structure & Test PurposesFor Release 4 | TP38(3-7 Dec 2018) | TP43(September 2019) | TP44(December 2019) | TP45(January 2020) |

# Work plan, time scale and resources

## Organization of the work

The STF will be under the monitoring and responsibility of TC SmartM2M, working together with 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 clause 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.

## 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

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

Task 2 – Test Purposes

Objectives: Implementation 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**: TC SmartM2M – oneM2M TST 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;

Task 3 – 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 4 – Test system implementation

Objectives: Implementation 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

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Mil.** | **Description** | **Target date** | **Meeting** |
| M1 | First drafts of test purposes and test cases for release 3 availableProgress report to be approved by SmartM2M#48 | 12-2018 | SmartM2M#48 – TBD |
| M2 | Stable drafts of test purposes and test cases for Release 3 availableProgress report to be approved by SmartM2M#49Validation of test cases in Plugtests™  | 03-2019 | SmartM2M#49 – TBD |
| M3 | First drafts of test purposes and test cases for release 4Progress report to be approved by SmartM2M#50 | 06-2019 | SmartM2M#50 – TBD |
| M4 | Progress report to be approved by SmartM2M#51Validation of early drafts of test cases in Plugtests™ | 09-2019 | SmartM2M#51 – TBD |
| M5 | Stable drafts of test purposes and test cases for Release 4Progress report to be approved by SmartM2M#52 | 12-2019 | SmartM2M#52 – TBD |
| **Total** |  |  |

## Task summary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **N** | **Task / Milestone / Deliverable** | Target date | Estimated cost |  |
| EUR | Days (optional) | CTI voluntary + oneM2M partners contribution |
| M0a | Preparatory Meeting | 1 Sep 2018 |  |  |  |
| M0b | Start of work | 01 Oct 2018 |  |  |  |
| T1 | Project management and code review | From 01-10-2018 to 30-12-2018 |  |  |  |
| T211 | Implementation of test purposes for release 3 | From 01-10-2018 to 30-12-2018 | 6 000 |  | 3 000 |
| T311 | Implementation of TTCN-3 test cases for release 3 | From 01-10-2018 to 30-12-2018 | 12 000 |  | 6 000 |
| M1 | First drafts of test purposes and test cases for release 3 availableProgress report to be approved by SmartM2M#48 | 12-2018 |  |  |  |
| T1 | Project management and code review | From 01-01-2019 to 30-03-2019 |  |  |  |
| T2.1.2 | Finalization of test purposes for release 3 | From 01-01-2019 to 30-03-2019 | 6 000 |  | 3 000 |
| T3.1.2 | Finalization of TTCN-3 test cases for release 3 | From 01-01-2019 to 30-03-2019 | 12 000 |  | 6 000 |
| T4.1 | Implementation of test system for release 3 | From 01-01-2019 to 30-03-2019 | 4 000 |  |  |
| T5.1 | Validation for release 3 | From 01-01-2019 to 30-03-2019 | 5 000 |  | 1 000 |
| M2 | Stable drafts of test purposes and test cases for Release 3 availableProgress report to be approved by SmartM2M#49Validation of test cases in Plugtests™  | 03-2019 |  |  |  |
| T1 | Project management and code review | From 01-04-2019 to 30-06-2019 |  |  |  |
| T2.2.1 | Implementation of test purposes for release 4 | From 01-04-2019 to 30-06-2019 | 6 000 |  | 3 000 |
| T3.2.1 | Implementation of TTCN-3 test cases for release 4 | From 01-04-2019 to 30-06-2019 | 12 000 |  | 6 000 |
| M3 | First drafts of test purposes and test cases for release 4Progress report to be approved by SmartM2M#50 | 06-2019 |  |  |  |
| T4.2 | Implementation of test system for release 4 | From 01-07-2019 to 30-09-2019 | 4 000 |  | 1 000 |
| T5.2 | Validation for release 4 | From 01-07-2019 to 30-09-2019 | 5 000 |  |  |
| M4 | Progress report to be approved by SmartM2M#51Validation of early drafts of test cases in Plugtests™ | 09-2019 |  |  |  |
| T1 | Project management and code review | From 01-10-2019 to 30-12-2019 |  |  |  |
| T2.2.2 | Finalization of test purposes for release 4 | From 01-10-2019 to 30-12-2019 | 6 000 |  | 3 000 |
| T3.2.2 | Finalization of TTCN-3 test cases for release 4 | From 01-10-2019 to 30-12-2019 | 12 000 |  | 6 000 |
| M5 | Stable drafts of test purposes and test cases for Release 4Progress report to be approved by SmartM2M#52 | 12-2019 |  |  |  |
| **Total** | **90 000** |  | **38 000** |

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| **Task Milest.** | Description | **O** | **N** | **D** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |
| T1 | Project management and code review |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T2 | Implementation of test purposes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T3 | Implementation of TTCN-3 test cases  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T4 | Implementation of test system |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T5 | Validation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M1 | First drafts of test purposes and test cases for release 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M2 | Validation in Plugtests™ and stable drafts of test purposes and test cases for Release 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M3 | First drafts of test purposes and test cases for release 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M4 | Validation of early drafts of test cases in Plugtests™ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M5 | Stable drafts of test purposes and test cases for Release 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## Working methods and travel cost

The STF (Specialist Task Force) under the monitoring and responsibility of oneM2M WG TST, working together with 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. 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)

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| --- | --- | --- |
| **Travel** | **Number** | **Cost estimate** |
| Events | 2 | 9 000 € |
| Meetings | 9 | 6 000 € |
| **Total** |  | **15 000 €** |

# Expertise required

## Team structure

Up to 3 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 knowledge of Java for TTCN-3 test adapter and codec;
* 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 | 90 000 |

## Travel cost

|  |  |  |
| --- | --- | --- |
| **Expected travels** | **Cost estimate for ETSI FWP** | **CTI voluntary + oneM2M partners contribution** |
| Participation to 2 Plugtests™ to validate the TTCN-3 test suites | 9 000 | 4 000 |
| Participation to 5 meetings (only those out of Europe) for reporting to stakeholders | 6 000 | 3 000 |
| **Total cost** | **15 000** | **7 000** |

## 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

During 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** |
| 0.0 | 20-Mar-2018 | Enrico Scarrone, Miguel Angel Reina Ortega |  | Initial draft |
| 0.1 | 25-May-2018 | Youssouf Sakho | Approved by correspondence by TC SmartM2M on 15-May-2018 | Editorials before submission to Board Review Panel |
| 0.2 | 11-June-2018 | Youssouf Sakho | Approved by correspondence by TC SmartM2M on 15-May-2018 | Update:* Document approval status
* Supporting members
 |
| 0.3 | 12-June-2018 | Enrico Scarrone | Required updates from OCG/Board consultation | Update:* Supporting members
* ETSI FWP budget reduction
* Section 3, link to ETSI activities
 |
| 0.4 | 09-July-2018 | Youssouf Sakho | Board Approved | Editorials before CL publication |