|  |  |
| --- | --- |
| ETSI_logo_Office_Colour_Small | ToR STF DO (TC SmartM2M) |
| Version: 0.7b |
| Author: SmartM2M/Omar Elloumi on 02 April 2019  |
| Last updated by: Patrick Guillemin/Youssouf Sakho. Date: 15 October 2019 |
| page 1 of 9 |

Terms of Reference - Specialist Task Force

STF DO (TC SmartM2M)

Artificial Intelligence for IoT Systems

Summary information

|  |  |
| --- | --- |
| Approval status | -SmartM2M(19)000021r2 (STF AI4IoT ToRs) approved by SmartM2M on 15 April 2019 and edited by ETSI Secretariat/Patrick Guillemin-Then for OCG/Board consultation by correspondence (2 weeks) between 30 April to the 15 May 2019, -and then to be presented for approval to Board#123 (12 June 2019)-resubmitted before the 30 August deadline for a second ETSI Board approval-approved by Board#124 |
| Funding | **Maximum budget: 70 000 € ETSI FWP** |
| Time scale | January to December 2020  |
| Work Items  | [DTR/SmartM2M-103674 (TR 103 674)](https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=57866" \t "_blank) Architecture AI4IoT[DTR/SmartM2M-103675 (TR 103 675)](https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=57867) PoC AI4IoT |
| Board priority  | [ETSI STF funding criteria](https://portal.etsi.org/STF/STFs/Funding/ETSIbudget.aspx): Innovation in Mature Domains (expanding the reach of oneM2M); Emerging Domain for ETSI (Artificial Intelligence) |

Part I – Reason for proposing the STF

# Rationale

Artificial Intelligence (AI) has recently experienced significant breakthroughs, in part due to its ability to build on the promises of both Big Data and Machine Learning (ML) and offer a vast range of promising new services. The applications of Artificial Intelligence technologies are emerging in a large range of Industries and start to provide added-value to many ICT systems, including IoT systems. In the vast number of new applications of AI announced daily, still a large number is more expectations than actual implementations based on proven science and technology. In the case of IoT, the situation is not different, and many hurdles still have to be passed before fully catching IA as a business opportunity.

In its Communication COM(2018) 237 on “Artificial Intelligence for Europe”, the European Commission notes that “Like the steam engine or electricity in the past, AI is transforming our world, our society and our industry.” And intends to “facilitate access of all potential users, especially small and medium-sized enterprises, companies from non-tech sectors and public administrations, to the latest technologies and encourage them to test AI.”.

AI is already present in a number of applications in domains such as finance, health, logistics, smart buildings or manufacturing, especially when the deployment of AI algorithms within existing systems is supported by very powerful data management and computing capabilities. In the same movement, it is gradually integrated within of all kinds of networks and support a growing number of deployment models, those cloud-based to start with. There is a potentially large variety of AI applications, but they all have in common the need to be supported by a proper architectural structure, a capacity to easily integrate technology building blocks and components and the need to guaranty continued interoperability.

oneM2M, the global standards Partnership Project for M2M communications and the IoT, has published a very large set of oneM2M specifications, designed not only to enable basic connectivity between applications and devices, but also to offer a broader support to higher levels of interoperability (such as semantic interoperability) and to security by enabling end-to-end secure information exchange between any devices or servers, as well as implementing dynamic access control. The oneM2M specifications are constantly evolving in order to take into account new advances in technology and Artificial Intelligence is one of them.

For oneM2M, Artificial Intelligence comes as a challenge and an opportunity. One the one hand, AI is posing a challenge to oneM2M because of its data-centric approach and its huge requirements in terms of resources available in the cloud domain as well as at the edge of the IoT network. A global approach to the management of data and the deployment of innovative algorithms requires adaptations to the oneM2M architecture that, in any case, already started in order to take into account virtualisation or Big Data. On the other hand, AI is also an opportunity for oneM2M to provide open solutions to applications and services developers together with maintaining and enlarging its core asset of support to interoperability.

TC SmartM2M, as a partner of and contributor to oneM2M, is interested in addressing these questions, understanding the implications on the IoT (High-Level) Architectures. This will be achieved by analysing selected Use Cases and understanding which adaptations are required, what are the components that may be needed in support of this, and by making an early Proof of Concept (PoC) based on these initial findings.

Considering that this topic is at the intersection of IoT, Artificial Intelligence, Big Data, Cloud (and Edge) Computing, TC SmartM2M cannot rely on voluntary efforts of its members and requires a specific funding. It is important that the approach proposed is addressed – and as much as possible - validated rapidly, in order to make sure that it may be positively confronted with the alternatives coming from other sources, in the IoT or the Cloud Computing communities.

# Objective

The objective of the current proposal is to provide an initially validated architecture that describes how IoT systems can make use of Artificial Intelligence (AI) and Machine Learning (ML) for the management and interpretation of IoT devices data over a large variety of deployment models (e.g., edge or cloud-based) while remaining interoperable, secure and manageable. The challenge is twofold.

On the one hand, the use of AI and ML techniques are expected to improve drastically the quality of the decisions that can be taken from the analysis of the massive amount of data that is generated by the IoT devices. An example of the new applications and services opportunities offered is predictive maintenance: its goal is to predict component failure and to prevent the occurrence of the failure by performing maintenance. Predictive maintenance brings together various technologies, several of them pertaining to Artificial Intelligence and Machine Learning, such as ad-hoc statistical analysis, predictive modeling, data mining, text analytics, optimization, real-time scoring and machine learning. These techniques support IoT systems administrators by identifying specific patterns in data and make decisions about how to handle what may happen next. The adoption of such AI and ML techniques require the integration of a large number of functions (and associated components) that must be done while preserving the interoperability and openness in the system.

On the other hand, considering that AI and ML are requiring specialised components and intensive computing resources, their usage is associated with additional stringent requirements that have an impact on the IoT system architecture. Consequently, another major objective of this proposal is to identify the requirements for the extension/adaptation of the IoT architectures in order to better integrate AI/ML techniques and ensure that the associated management of data is well handled by the IoT Service Layer.

The rationale for such adaptations will be clarified by an early proof of the validity of the approach based on significant Use Cases and on a prototype implementation of that use case. The purpose of the activity is to provide a set of results that will serve as an input and an accelerator to further standardization work, in particular through the contributions of SmartM2M to the work of oneM2M.

The applications of AI are concerning a large number of the “verticals” that are addressed by the work of ETSI Technical Bodies and ISGs. Examples of such sectors are the Automotive (with the major case of the ITS Technical Committee) or Smart Cities (with important aspects such as Smart Energy, Smart Buildings or Smart Water Management). Even if those sectors have strong specificities, it is highly possible to outline commonalities on the required evolutions and this should be demonstrated through the analysis of a relevant Use Case that will serve as a support to the analysis and the development of an early validation.

The analysis and early validation of the application is meant to be very focused and as little resource consuming as possible. A major focus of the work will be the contribution to the required evolutions of oneM2M and SAREF and, most importantly, to the required dissemination effort towards the oneM2M and SAREF communities. It is expected that the STF results be provided in a way that will allow oneM2M members to promote their adoption in the oneM2M specifications.

The proposed work will rely on two main activities:

* The identification of the main challenges that the use of AI and ML create for the current standardised solutions for IoT systems (in particular oneM2M), an analysis of the new requirements and how they can be dealt with by an adaptation of the existing standardised architectures. This means in particular:
	+ The in-depth analysis of a relevant Use Case, in particular in order to identify the additional requirements it brings on the IoT system, in particular in terms of architecture and supporting components. The candidate Use Cases amongst which the target Use Case will be selected are:
		- Fault Management and Isolation for IoT field devices
		- Detection of patterns in video streams (e.g., car vandalism, fire detection)
	+ Identify architecture implications, in relation with some of the activities undertaken in relevant organisations such as the oneM2M PP, ETSI and the SAREF related activities, the AIOTI WG3, and (as an input to the work) the SDOs involved in IoT architecture (e.g. ITU-T or IEEE) and some emerging fora such as the BDVA consortium.
* The development of a Proof-of-Concept (PoC) implementation for the chosen Use Cases using the oneM2M service layer and taking into account the architecture analysis. This development will be based on available Open Source components which will be identified and quickly surveyed. The PoC code will be documented and provided (fully released) to ETSI for future evolutions and reuse.

The STF will deliver two Technical Reports (TR). The first TR will analyse use cases in order to describe how IoT systems can make use of Artificial Intelligence and Machine Learning and the new architectural elements (e.g., architecture principles and layering, components, required mappings, etc.) that are required. The second TR will describe in deeper terms the implementation of the Use Cases selected for the PoC, in particular the main components developed and how they can be applied for a oneM2M based service layer. While oneM2M will be used to validate the concept, the principles would still be applicable to other and complementary IoT service layers.

# Relation with ETSI strategy and priorities

The proposed architecture and Proof of Concept (PoC) activities in this STF are directly related and in line with the two ETSI STF funding criteria:

* “Innovation in Mature Domains" by expanding the reach of oneM2M standards to cloud-based architecture and new component models;
* "Emerging Domain for ETSI" by addressing the wider support of oneM2M standards by Artificial Intelligence, and the identification and definition of components in support.

This proposed STF is in line with the following objectives of the ETSI Long Term Strategy:

* "Being at the Heart of Digital". This proposal supports the efforts of ETSI as a major point for ICT related standardization, in particular by allowing ETSI - as a founding partner of oneM2M – to ensure that new Artificial Intelligence and Machine Learning techniques are supported by oneM2M standards;
* "Being an Enabler of Standards". This STF aims at providing blueprints for the specification and development of components that support a wider adoption of oneM2M standards;
* "Being Global". This STF is supporting the applicability of oneM2M standards to a wider range of IoT architectures and systems worldwide and across multiple industry domains.

# Context of the proposal

## ETSI Members support

At the time of writing this proposal, the following companies have expressed support. Some others may join when the discussion on the SmartM2M work items will be finalised.

|  |  |  |
| --- | --- | --- |
| **ETSI Member** | **Supporting delegate** | **Motivation** |
| Nokia Belgium | Omar Elloumi | Next logical evolution step for oneM2M work, ensuring we move from data collection to extracting value from data and pave the way for profitable digital transformation. |
| TELECOM ITALIA S.p.A. | Enrico Scarrone | The evolution of IoT will soon confirm the need for a generalized introduction of AI components / engines in the IoT systems enabling an optimized semantic interoperability. |
| BT plc | Colin Blanchard | This will provide new use cases to demonstrate and enhance the semantic capability and inter-operability of an oneM2M Service Layer, continuing to move up the value chain of M2M/IoT platforms and applications |
| CNRS | Samir Medjiah | This will show the opportunities brought by AI for enhancing (oneM2M) IoT platforms and for enabling advanced IoT applications |
| CommLedge | Emmanuel Darmois | An important opportunity to boost oneM2M |
| Sensinov | Mahdi Ben Alaya | Bringing the power of AI to the Internet of Things |
| Huawei Technologies Sweden AB | Francisco da Silva | The evolution of IoT will soon confirm the need for a generalized introduction of AI components / engines in the IoT systems enabling an optimized semantic interoperability. |

## Market impact

The objective of the current proposal is to provide an initially validated architecture that describes how IoT systems can make use of Artificial Intelligence and Machine Learning for the management and interpretation of IoT devices data over a large variety of deployment models (e.g., cloud or edge-based) while remaining interoperable, secure and manageable. The application of this architecture in the context of oneM2M standardisation would have an impact on the IoT market by enabling a wider range of open IoT systems.

Conversely, the potential extension of the oneM2M standards support to this new kind of architectures will enrich the footprint of oneM2M standardization and support a larger number of actors and activities.

## Tasks for which the STF support is necessary

As outlined above, the proposed work will rely first on the analysis of relevant Use Cases. the analysis of the architecture implications, in relation with some of the activities undertaken in relevant organisations such as oneM2M PP, ETSI and the SAREF related activities, AIOTI WG3, SDOs involved in IoT (e.g. ITU-T or IEEE) and some emerging for a such as BDVA (Big Data PPP).

But the development of a PoC implementation taking into account the architecture analysis and the nature of the use case will have to rely on the resources provided by the STF. The final code will be available on an ETSI source code repository (the practical details for such repository will be defined separately in agreement with ETSI).

## 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

N/A

## Consequences if not agreed

The STF will provide significant architecture and implementation results that would have to be recreated in the case the STF is not accepted. This work might be added to the work plan of SmartM2M and/or oneM2M but with no guarantee that it will be done in time.

If no progress on the adaptation of the IoT architectures (specially oneM2M) towards Artificial Intelligence is done in SmartM2M/oneM2M, the footprint of proprietary solutions (and ad-hoc partial solutions) could become dominant in the definition of the next generation of IoT systems, thus preventing the definition of more open solutions that can benefit from the best of the new technology.

Part II - Execution of the work

# Technical Bodies and other stakeholders

## Reference TB

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

## Other interested ETSI Technical Bodies

The oneM2M Partnership Project and the ETSI SAREF activities will directly benefit from the STF results.

## Other stakeholders

The Open Source Communities around oneM2M may benefit from the results of the STF and take the output of the development of the STF PoC into their roadmaps.

# Base documents and deliverables

## Base documents

|  |  |  |  |
| --- | --- | --- | --- |
| **Document** | **Title** | **Current Status** | **Expected date for stable document** |
| oneM2M TS-0001 | oneM2M; Functional Architecture (oneM2M TS-0001 version 2.10.0 Release 2) | Published |  |
| oneM2M TS-0009 | oneM2M; HTTP Protocol Binding (oneM2M TS-0009 version 2.6.1 Release 2) | Published |  |
| ETSI TR 103 527 | SmartM2M; Virtualized IoT Architectures with Cloud Back-ends | Published |  |

## Deliverables

|  |  |  |
| --- | --- | --- |
| **Deliv.** | **Work Item code****Standard number** | **Working title****Scope** |
| D1 | [DTR/SmartM2M-103674 (TR 103 674)](https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=57866)  | Working title: Architecture AI4IoTTitle : Artificial Intelligence and the oneM2M architectureScope:Detailed description of selected use cases and identification of architectural evolutions (components, required mappings, etc.) to the oneM2M framework. |
| D2 | [DTR/SmartM2M-103675 (TR 103 675)](https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=57867)  | Working title: PoC AI4IoTTitle : AI for IoT: A Proof of ConceptScope: Detailed description of the use cases design and implementation; instructions for the (re-)creation of the prototypes from the selected framework and components; lessons learned. |

## Deliverables schedule:

The following schedule applies to the 2 WI created in ETSI TC SmartM2M.

**Details of**[**'DTR/SmartM2M-103674'**](https://portal.etsi.org/webapp/workProgram/Report_WorkItem.asp?wki_id=57866)**Work Item Schedule**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Code** | **Status** | **Action** | **Target** | **Achieved** | **Version** |
| **0** | **Creation of WI by WG/TB** |   | 2019-04-15 | 2019-04-15 |  |
| **0 p** | **WI proposed to TB** |   |   | 2019-04-15 |  |
| **0 a** | **TB adoption of WI** |   | 2019-04-15 | 2019-04-15 |  |
| **1** | **Start of work** |   | 2020-01-13 |   |  |
| **2** | **Early draft** |   | 2020-02-03 |   |  |
| **4** | **Stable draft** |   | 2020-04-30 |   |  |
| **6** | **Final draft for approval** |   | 2020-06-30 |   |  |
| **8** | **TB approval** |   | 2020-09-30 |   |  |
| **8 A** | **Draft receipt by ETSI Secretariat** |   | 2020-10-09 |   |  |
| **12** | **Publication** | PU | 2020-12-14 |   | 1.1.1 |

**Details of**[**'DTR/SmartM2M-103675'**](https://portal.etsi.org/webapp/workProgram/Report_WorkItem.asp?wki_id=57867)**Work Item Schedule**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Code** | **Status** | **Action** | **Target** | **Achieved** | **Version** |
| **0** | **Creation of WI by WG/TB** |   | 2019-04-15 | 2019-04-15 |  |
| **0 p** | **WI proposed to TB** |   |   | 2019-04-15 |  |
| **0 a** | **TB adoption of WI** |   | 2019-04-15 | 2019-04-15 |  |
| **1** | **Start of work** |   | 2020-04-02 |   |  |
| **2** | **Early draft** |   | 2020-05-29 |   |  |
| **4** | **Stable draft** |   | 2020-06-30 |   |  |
| **6** | **Final draft for approval** |   | 2020-08-31 |   |  |
| **8** | **TB approval** |   | 2020-09-30 |   |  |
| **8 A** | **Draft receipt by ETSI Secretariat** |   | 2020-10-09 |   |  |
| **12** | **Publication** | PU | 2020-12-14 |   | 1.1.1 |

# Work plan, time scale and resources

## Organization of the work

The STF will be under the monitoring and responsibility of TC SmartM2M.

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

Input: STF Terms of Reference

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

Interactions: TC SmartM2M – oneM2M (via TC SmartM2M)

Resources required

* good knowledge of relevant oneM2M standards;
* good experience of AI techniques and architectures;
* good knowledge of software engineering and open source techniques;

Task 2 – Identification of Architecture Evolutions

Objectives: Analysis of the architecture requirements and use cases. Definition of the architectural evolutions required.

Input:

Output: A Technical Report.

**Interactions**: TC SmartM2M – oneM2M (via TC SmartM2M)

Resources required

* good knowledge of relevant oneM2M standards;
* expert knowledge of AI techniques and architectures;

Task 3 – Proof-of Concept

Objectives: Specification of the use case. Definition and realization of the implementation.

Input: Initial draft of Task 2 report

Output: A Technical Report. Open Source code available in ETSI repository

Interactions: TC SmartM2M – oneM2M (via TC SmartM2M)

Resources required

* expert knowledge of relevant oneM2M standards;
* good experience of AI techniques, architectures and components;
* expert knowledge of software engineering and open source techniques;

Task 4 – Dissemination and promotion in Standards

Objectives: Dissemination towards oneM2M and the IoT community. This should encompass the attendance to at least 3 oneM2M Technical Meetings.

Input: Task 2 and Task 3 reports

Output: Presentations, draft documents to promote towards oneM2M members for submission.

**Interactions**: TC SmartM2M – oneM2M (via TC SmartM2M)

Resources required

* good knowledge of relevant oneM2M standards;
* expert knowledge of AI techniques and architectures;

## Milestones

Milestone 0 is the start of the actual work of the Experts after the recruitment phase.

The following Milestones are applying:

Milestone 1 Detailed specification of use cases

Milestone 2 Stable draft of architecture evolutions

Milestone 3 Use cases PoC specified (early TR draft)

Milestone 4 Stable draft of PoC architecture TR

Milestone 5 Final use cases implementation

Milestone 6 Deliverables approved

Milestone 7 Deliverables published and STF closed

## Task summary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **N** | **Task / Milestone / Deliverable** | Start date | **Target date** | **Cost (EUR)** |
| M0 | Start of work |  | 13/01/2020 |  |
| T1 | Project management and code review | 13/01/2020 | 31/12/2020 | 3 000 |
| T2 | Identification of Architecture Evolutions | 13/01/2020 | 31/07/2020 | 18 000 |
| M1 | Detailed specification of use cases: early draft DTR/SmartM2M-103674 and Progress report approved by SmartM2M by RC |  | 29/02/2020 |  |
| T3 | Proof of Concept  | 02/04/2020 | 30/09/2020 | 26 000 |
| M2 | Stable draft of architecture evolutions: stable draft DTR/SmartM2M-103674 and Progress report approved by SmartM2M by RC |  | 30/04/2020 |  |
| M3 | Use cases PoC specified: early draft DTR/SmartM2M-103675 available |  | 29/05/2020 |  |
| M4 | Stable draft of PoC architecture TR: stable draft DTR/SmartM2M-103675 and Final draft DTR/SmartM2M-103674 available.Progress report approved by SmartM2M#54 |  | 30/06/2020 |  |
| T4 | Dissemination towards oneM2M and the IoT community | 01/06/2020 | 31/12/2020 | 16 000 |
| M5 | Final use cases implementation reviewed by ETSI/CTI |  | 31/08/2020 |  |
| M6 | Deliverables and Final report approved by SmartM2M#55 |  | 30/09/2020 |  |
| M7 | Deliverables published and STF closed |  | 31/12/2020 |  |
|  |  |  |  | **63 000** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task Milest.** | **Description** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |
| T1 | **Project management and code review** |  |  |  |  |  |  |  |  |  |  |  |  |
| T2 | **Identification of Architecture Evolutions** |  |  |  |  |  |  |  |  |  |  |  |  |
| M1 | Architecture evolutions specified |  | X |  |  |  |  |  |  |  |  |  |  |
| T3 | **Proof of Concept** |  |  |  |  |  |  |  |  |  |  |  |  |
| M2 | Stable draft of architecture evolutions |  |  |  | X |  |  |  |  |  |  |  |  |
| M3 | Use cases PoC specified (early TR draft) |  |  |  |  | X |  |  |  |  |  |  |  |
| M4 | Stable draft of PoC architecture TR |  |  |  |  |  | X |  |  |  |  |  |  |
| M5 | Final use cases implementation |  |  |  |  |  |  |  | X |  |  |  |  |
| M6 | Deliverables approved |  |  |  |  |  |  |  |  | X |  |  |  |
| T4 | **Dissemination (oneM2M and others)** |  |  |  |  |  |  |  |  |  |  |  |  |
| M7 | Deliverables published, STF closed |  |  |  |  |  |  |  |  |  |  |  | X |

## Working methods and travel cost

Travel cost for working sessions will be included in the contract compensation (manpower cost). Presentation of results to the reference TB and other TBs will be reimbursed as real cost from the travel budget. For other cases, refer to the travel budget table in Part III.

# Expertise required

## Team structure

The membership of the STF will ensure the following mix of competences:

* good knowledge of relevant oneM2M standards;
* expert knowledge of AI techniques and architectures;
* expert knowledge of software engineering and open source techniques;

Part III: Financial conditions

# Maximum budget

## Manpower cost

|  |  |
| --- | --- |
| **Description** | **Maximum estimated cost (€)** |
| Service contracts | **63 000** |

## Travel cost

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

* Present STF Progress Report and deliverables to TC SmartM2M, oneM2M and other ETSI TC meetings over the duration of the action (5 meetings)

|  |  |
| --- | --- |
| **Expected travels** | **Cost estimate** |
| TC SmartM2M, oneM2M and other ETSI TC meetings over the duration of the action (5 meetings) | 7 000 |
| **Total cost** | **7 000** |

## Other Costs

NA.

Part IV: STF performance evaluation criteria

# Key Performance Indicators

Contribution from ETSI Members to STF work

* Support to the STF work (e.g. provision of test–beds)
* 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 TB
* 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

Liaison with other stakeholders

* Stakeholder participation in the project (category, business area)
* Cooperation with other standardization bodies/organisations
* 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 | 29/03/2019 |  | Draft | Initial version |
| 0.2 | 30/03/2019 |  | Draft | Version for discussion at SmartM2M meeting |
| 0.3 | 02/04/2019 |  | Draft | Updated after SmartM2M meeting (01/04/19) |
| 0.4 | 15/04/2019 |  | Draft | Updated during TC SmartM2M meeting (15/04/19) |
| 0.5 | 15/04/2019 |  | Approved | Approved after editing at 15/04/19 TC SmartM2M meeting |
| 0.5 | 17/04/2019 |  | Approved | ETSI Technical Officer review for conformityReady for 29 April STFManager consolidation |
| 0.6 | 29/04/2019 | Youssouf Sakho | Approved | Editorials before Review Panel |
| 0.7a | 28/08/2019 and 03/09/2019 | Patrick Guillemin/Youssouf Sakho | Approved | Editorials before Review Panel |
| 0.7b | 16/10/2019 | Patrick Guillemin/ Youssouf Sakho | Approved | Start of Work = 13 January 2019 defined in IKoM, WI Schedules and milestones adjusted (with no structural change) |