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| ToR STF DT/589 (TC SmartM2M) |
| Version: 0.7 |
| Author: SmartM2M – Date: 2019-08-16 |
| Last updated by: Youssouf Sakho – Date: 2020-01-08 |
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Terms of Reference –Specialist Task Force Proposal

STF DT (Ref. Body SMARTM2M)

Semantic Discovery and Query in oneM2M

Summary information

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| --- | --- | --- |
| Approval status | Approved by SmartM2M#51 (doc ref: SmartM2M(19)051013r2)  | **YES** |
| Approved by Board#124 (2019-09-24 to 2019-09-26) | **YES** |
| Reference Body | SmartM2M |
| ETSI Funding | **Maximum budget : 125 000 EUR** |
| Minimum of 4 ETSI Members Support | **YES** |
| Time scale | **From** | 2020-02-06 |
| **To** | 2021-06-30 |
| Work Items  | *DTR/SmartM2M-103714 (TR 103 714)* *DTR/SmartM2M-103715 (TR 103 715)* *DTR/SmartM2M-103716 (TR 103 716)* *DTR/SmartM2M-103717 (TR 103 717)* *DMI/SmartM2M-123154 (MI) miscellaneous work item*  |
| Board priority | [ETSI STF funding criteria](https://portal.etsi.org/STF/STFs/Funding.aspx)

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| --- | --- |
| **Priority Criteria** |  |
| Maintenance of standards in mature domains |  |
| Innovation in mature domains | X |
| Emerging domains for ETSI | X |
| Horizontal activities (quality, security, etc.) | X |
| Societal good / environmental |  |

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Part I – STF Technical Proposal

# Rationale & Objectives

## Rationale

The activity proposed is the study and development of semantic Discovery and Query capabilities for oneM2M and its contribution to the oneM2M standard.

The goal is to enable an easy and efficient discovery of information and a proper interworking with external source/consumers of information (e.g. a distributed data base in a smart city or in a firm), or to directly search information in the oneM2M system for big data purposes.

oneM2M has currently native discovery capabilities that work properly only if the search is related to specific known sources of information (e.g. searching for the values of a known set of containers) or if the discovery is well scoped and designed (e.g. the lights in a house). When oneM2M is used to discover wide sets of data or unknown sets of data, the functionality is typically integrated by ad hoc applications that are expanding the oneM2M functionality. This means that this core function may be implemented with different flavours and this is not optimal for interworking and interoperability.

This STF activity requires expertise in discovery protocols, routing mechanisms (in particular exhaustive vs. non- exhaustive one), lower level agnosticism vs. non agnosticism, distributed data bases topologies, query languages. Syntax and types and suitable **ontologies** to model queries and abstract features objects, security and control access mechanisms, complexity issues management to increase efficiency., It will be designed based on the principle and the solution defined by the SAREF standard developed in TC SmartM2M (that currently is also aligned with the W3C ontology approach), and will be built on the functionality and the architecture offered by the oneM2M standard, with the goal to expand the oneM2M standard capabilities.

The work will look at the query and discovery mechanisms, complexity, queries exhaustiveness (non-exhaustive list) already available in industrial solutions, starting from the ones defined by ETSI (e.g., the one included in NGSI-LD), to extract (and adapt) the applicable components and to assure as smooth interworking with relevant non-oneM2M solutions.

The supporting companies active in oneM2M will provide the oneM2M architectural, functional and knowledge needed to integrate the STF specific expertise on discovery and semantic, and to support the contribution to oneM2M.

## Objectives of the work to be executed

This activity is composed as follows:

1. A **requirements** phase where requirements and use cases will be formally identified and defined. As a minimum, this work should include discovery of specific information and of aggregated information, and interaction with external sources of data and queries. The oneM2M architecture, the oneM2M semantic approach, the current oneM2M capabilities and SAREF will be at the basis of these use cases and requirements. This work will be documented in deliverable DTR/SMARTM2M-103714 (TR 103 714)/D1. Selected use cases and requirements would be also contributed to oneM2M TR-0037 (Use cases) and TS-0002 (Requirements). A dedicated work item will be prepared and contributed to oneM2M with the help of the supporting companies. All the contributions and discussions with oneM2M will be collected and documented in deliverable DMI/SMARTM2M-123154 (MISCELLANEOUS WORK ITEM)/D5.
2. A **study** phase where possible approaches (existing and new ones) to a discovery and data aggregation solution will be analysed with respect to the use cases and requirements. In particular the need to plug in the solution on the oneM2M standard will drive the solution analysis, to determine the best approach to be followed. The activity will also look to the query and discovery mechanisms already available, starting from the ones defined by ETSI (e.g. the one included in NGSI-LD) to extract (and potentially adapt) the applicable components and to assure a smooth interworking with non-oneM2M solutions. This will be documented in ETSI deliverable DTR/SMARTM2M-103715 (TR 103 715)/D2. The relevant approaches will be presented and discussed with oneM2M to consolidate a shared view to be developed in the STF. All the contributions and discussions with oneM2M will be collected and documented in deliverable DMI/SMARTM2M-123154 (MISCELLANEOUS WORK ITEM)/D5.
3. A **simulation** phase will be conducted in parallel and “circular” feedback with respect to the study phase, with the goal to provide a proof of concept, run suitable scenarios provided by previous phases and a performance evaluation to support the selection/development of the Discovery and Query solution. The simulator/emulator and the simulation results will be documented in deliverable DTR/SMARTM2M-103716 (TR 103 716)/D3. An extract of the simulation results will be included in deliverables DTR/SMARTM2M-103715 (TR 103 715)/D2 and DTR/SMARTM2M-103717 (TR 103 717)/D4, and will be used to support the discussion and the proposal with oneM2M (documented in deliverable DMI/SMARTM2M-123154 (MISCELLANEOUS WORK ITEM)/D5). A selection of the use cases will include a set of oneM2M relevant configurations scenarios to be considered for the simulation activity described below.
4. A **standardization** phase where the Discovery and Query solution will be specified and documented in deliverable DTR/SMARTM2M-103717 (TR 103 717)/D4. The solution will be contributed to existing oneM2M TS-0001 (Architecture), oneM2M TS-0034 (Semantic support), oneM2M TS-0033 (Interworking Framework), oneM2M TS-0004 (Protocols) (other TS may be also impacted) with the help of the supporting companies active in oneM2M. All the contributions and discussions conducted oneM2M will be collected and documented in deliverable DMI/SMARTM2M-123154 (MISCELLANEOUS WORK ITEM)/D5.

## Previous funded activities in the same domain

TC SmartM2M did not benefit in the past of funded activities in the domain of semantic discovery/queries support and related solution development.

The mentioned relation with the SAREF work (that has been funded by ETSI also in relation to EC/EFTA contracts) is dealing with the intention to reuse SAREF in the context of the discovery and communication of aggregated data, to assure a smooth interoperability with external sources/consumers of information.

## Market impact

The STF result is an expansion of the functionality of oneM2M. The expected goal is to assure interoperability in an area where oneM2M is often integrated with approaches that are not specified in the oneM2M standard. The expected market impact is to facilitate a wider adoption of oneM2M reinforcing the positioning of oneM2M as integration framework, and to get a deeper integration with SAREF and other ETSI specified technologies.

## Consequences if not agreed

This work requires specialist expertise in semantic and queries that is currently not available in oneM2M and SmartM2M. The specification of the features targets by this ToR will be not finalized in time respect to a major market adoption of oneM2M, leading to fragmentation on this specific aspect.

# Relation with ETSI strategy and priorities

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| --- | --- |
| **Priority Criteria** | **Rationale** |
| Maintenance of standards in mature domains |  |
| Innovation in mature domains | The current mature oneM2M standard would be expanded with innovative functionality to assure full interoperability with application and external source of information. |
| Emerging domains for ETSI | IoT is an emerging domain where ETSI is increasing its positioning. IoT is a complex and multi-aspect context and the standard offer needs to be expanded and completed. This activity on the discovery and communication of specific and aggregated data is deemed to make the current standard more appealing and easily usable in the various vertical sectors. |
| Horizontal activities (quality, security, etc.) | Semantic and discovery are technologies that are in horizontal respect and may be reused in multiple standardization context. |
| Societal good / environmental |  |

# ETSI Members Support

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| --- | --- | --- |
| **#** | **ETSI Member** | **Supporting delegate** |
| 1 | TIM (Telecom Italia S.p.A) | Enrico Scarrone |
| 2 | UPM | Raùl Garcia Castro |
| 3 | INRIA | Luigi Liquori (INRIA/UCA) / Marie Agnes Peraldi (UNICE/UCA) |
| 4 | NEC | Lindsay Frost |
| 5 | Deutsche Telekom AG | Thomas Kessler |
| 6 | Institut Mines Telecom | Marc Girod Genet |
| 7 | HUAWEI Technology Sweden AB | Francisco Da Silva |
| 8 | EGM | Franck Le Gall  |

# Deliverables

## Base documents

|  |  |  |
| --- | --- | --- |
| **Document** | **Title** | **Status** |
| oneM2M TS-0001 /ETSI TS 118.101 | Functional architecture | Published |
| oneM2M TS-0002 /ETSI TS 118.102 | Requirements | Published |
| oneM2M TS-0004 /ETSI TS 118.104 | Core layer Protocols | Published |
| oneM2M TS-0034under ETSI transposition | Semantic Support | Published |
| oneM2M TS-0033 /under ETSI transposition | Interworking Framework | Published |
| oneM2M TR-0001 /ETSI TS 118.501 | Use Cases | Published |
| ETSI TS 103 264 | SmartM2M: Smart Application; Reference Ontology and oneM2M Mapping | Published |
| <https://www.w3.org/TR/wot-architecture/> | W3C Web of Things (WoT) Architecture | Candidate Recommendation |
| <https://www.w3.org/TR/wot-thing-description/> | W3C Web of Things (WoT) Thing Description | Candidate Recommendation |
| ETSI GS CIM 009 | Context Information Management (CIM) ; NGSI-LD API | Published |
| ETSI GS CIM 006 | Context Information Management (CIM); Information Model (MOD0) | Published |
| ETSI TS 103.378 | SmartBAN: Unified data representation formats, semantic and open data model | Published |
| ETSI TS 103.327 | SmartBAN: Service and application standardized enablers and interfaces, APIs and infrastructure for interoperability management | Published |

## New deliverables

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| --- | --- | --- | --- |
| **Deliv.** | **Work Item code****Standard number** | **Working title****Scope** | **Expected date for publication** |
| D1 | DTR/SMARTM2M-103714 (TR 103 714) | **Working title**: *Study for oneM2M Discovery and Query use cases and requirements***Scope**: this TR will identify additional requirements to be potentially submitted to oneM2M in the areas of discovery mechanism and query languages (syntax and semantic), by means of the development of relevant use cases. As a minimum, this work should include discovery of specific information and of aggregated information, and interaction with external sources of data and queries. The oneM2M architecture, the oneM2M semantic approach, the current oneM2M capabilities and SAREF will be at the basis of these use cases and requirements. | June 2020 |
| D2 | DTR/SMARTM2M-103715 (TR 103 715) | **Working title**: *Study for oneM2M Discovery and Query solutions analysis & selection***Scope**: This TR will identify, define and analyse relevant approaches with respect to the use cases and requirements developed in DTR/SMARTM2M-103714 (TR 103 714). The most appropriate one will be selected. The need to plug in the solution on the oneM2M standard will drive the solution analysis, to determine the best approach to be followed. The activity will also look to the query and discovery mechanisms already available, starting from the ones defined by ETSI (e.g. the one included in NGSI-LD) to extract (and potentially adapt) the applicable components and to ensure a smooth interworking with non-oneM2M solutions. | September 2020 |
| D3 | DTR/SMARTM2M-103716 (TR 103 716) | **Working title**: *Discovery and Query solution(s) simulation and performance evaluation***Scope**: to develop a simulator with the goal to provide a proof of concept and a preliminary performance evaluation and routing complexity to support the selection and development of the Discovery and Query solution to be contributed to oneM2M. An extract of the simulation results will be used to support the discussion and the proposal with oneM2M. We expect preliminary output of deliverable DTR/SMARTM2M-103716 (TR 103 716) to be feed to deliverable DTR/SMARTM2M-103715 (TR 103 715). | February 2021 |
| D4 | DTR/SMARTM2M-103717 (TR 103 717) | **Working title**: *Study for oneM2M Discovery and Query solution development***Scope**: To develop the specification for the discovery solution selected in deliverable DTR/SMARTM2M-103715 (TR 103 715). This deliverable will document the specification while the real standardization proposal will be contributed to oneM2M TS-0001 (Architecture), oneM2M TS-0034 (Semantic support), oneM2M TS-0033 (Interworking Framework), oneM2M TS-0004 (Protocols) (other oneM2M TS may be also impacted) with the help of the supporting companies active in oneM2M.  | May 2021 |
| D5 | DMI/SMARTM2M-123154 (MISCELLANEOUS WORK ITEM) | **Working title**: *oneM2M Discovery and Query STF contributions collection***Scope**: To collect contributions made on the basis of the STF results to oneM2M. The contributions will be developed by the STF with the support of the supporting companies active in oneM2M. This includes:* The selected use cases and requirements contributed to oneM2M.
* The proposed approach(es) shared in advance with oneM2M.
* An extract of the configuration and the related results of the simulation of the proposed approach(es) and the selected one.
* The contribution for the specification of the selected approach made to oneM2M.

It will also contain the reports and the result of the discussions conducted with oneM2M. | N/A Expected to be finalized by May 2021 |

# Maximum budget

## Task summary/Manpower Budget

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| --- | --- |
| **Task short description** | Budget (EUR) |
|
| Task 0 – Management | 8 000 |
| Task 1 – Use cases and requirements | 10 000 |
| Task 2 – Discovery and Query options analysis and selection | 20 000 |
| Task 3 – Discovery and Query simulation and evaluation | 30 000 |
| Task 4 – Discovery and Query solution development | 20 000 |
| Task 5 – oneM2M contributions and discussions | 18 000 |
|  |  |
| **TOTAL** | 106 000 |
| **Travel budget** | 19 000 |
| **Total including travel (see clause 5.2)** | 125 000 |

## Travel budget

This travel budget is related to the attendance to the ETSI SmartM2M meeting and the oneM2M Meetings necessary to discuss and exploit the STF results.

5 smartM2M meetings (2 person) 8 000 (10 missions in Europe)

5 oneM2M meetings (1 person) 11 000 (4 missions outside Europe + 1 mission in Europe).

This estimation of 19 000 EUR is additional to the Task budget.

## Other budget line

*Not applicable.*

Part II – Details on STF Technical Proposal

# Tasks, Technical Bodies and other stakeholders

## Organization of the work

The technical work is developed in 4 main technical tasks (requirements and use cases, solutions study, simulation/evaluation, solution developments), that are starting sequentially with partial overlap as described in the schedule. The reason of the sequential development is that each task is depending on the previous one in terms of initial stable results. The reason of the overlapping is that it is necessary to timely contribute to oneM2M according to the oneM2M stage schedule.

An additional continuous task is included to support explicitly the discussion and the contribution to oneM2M.

A management task completes the STF working structure.

The STF will take benefit of a Steering Committee that is composed by the TC SmartM2M attendees, with the exception of the STF experts, but including the STF leader, and will meet during the regular TC SmartM2M meetings. Representatives of the management of oneM2M will be invited to attend, interested representatives of other ETSI groups will be invited according to the needs or by request.

The expert work will be complemented by active contribution of the supporting companies in SmartM2M and oneM2M. The supporting companies (at least the one active in oneM2M) will support the contribution to oneM2M of the STF results. A successful relation with oneM2M is a key factor for the success of the activity. The oneM2M stage and release timing will be considered and the STF workplan will be adapted accordingly by the Steering Committee in agreement with the STF leadership and membership.

## Tasks for which the STF support is necessary

oneM2M full semantic Discovery and Query languages (syntax and semantics), with integration with SAREF/W3C and other potentially relevant works in ETSI.

## Other interested ETSI Technical Bodies

oneM2M is the main target for dissemination of the results of this STF. This STF proposal foreseen contributions to oneM2M with the support and participation of supporting companies.

SAREF work will be integrally included in this STF activity with attention to the work of W3C Semantic WEB (already integrated in SAREF) and to the potentiality of an integration of ISG CIM work relevant components (e.g. NGSI-LD).

The work would likely become relevant to other ETSI Bodies (e.g. TC ATTM, TC SmartBAN, EP eHEALTH, TC CYBER, etc) in relation to the semantic aspects and their interoperability.

## Other stakeholders

Many vertical sectors and institutions will benefit from this STF, that is aiming to complete the oneM2M feature with full semantic Discovery and Query capability with high integration with existing works in ETSI, first of all the SAREF results. We could expect this technology to be applied in other specific domains. This will provide more wide market impact and efficacy in the integration of the different vertical sectors, giving another enabler for semantic interoperability, looking for a Digital Market acceleration.

The work is expected to be of interest for the EU institutions for the expected impact of the Digital Market evolution, the vertical business sectors for enriching the interoperability offer from the standard environment, the academy for the semantic progresses, the local regional and municipal institutions for the enabled service integration scenarios.

Part III: Execution of Work

# Work plan, time scale and resources

## Task description

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| **Task # 0** | **Management** |
| **Objectives** | Provide appropriate development of the work in term of quality and timely delivery to ETSI TC SmartM2M and to oneM2M. |
| **Input** | This ToR and the feedbacks form TC SmartM2M (which is also the steering committee of this STF activity) |
| **Output** | Timely and continuous reporting and coordination with TC SmartM2M, STF reports to ETSI. |
| **Interactions** | With TC smartM2M to steer the work, with oneM2M management to ensure coordination with oneM2M releases and stage deadlines |
| **Resources required** | STF management skills, Technical management skills and expertise in STF. Technical knowledge on semantic, discovery, SAREF; W3C, oneM2M. |

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| **Task # 1** | **Use cases and requirements** |
| **Objectives** | Identify and develop use cases and requirements for semantic discovery/queries (syntax, semantics, topology, etc.) in oneM2M. As a minimum, this work should include discovery of specific information and of aggregated information, and interaction with external sources of data and queries. The oneM2M architecture, the oneM2M semantic approach, the current oneM2M capabilities and SAREF will be at the basis of these use cases and requirements.  |
| **Input** | The architectures, the requirements and the use cases contained in the deliverables identified in clause 4.1. of this ToR (Base documents) |
| **Output** | * TC SmartM2M TR DTR/SMARTM2M-103714 (TR 103 714)/D1.
* Selected use cases and requirements contributed to oneM2M TR-0037 (Use cases) and TS-0002 (Requirements). These use cases will also identify the base configuration
* A oneM2M Work Item Description for this new discovery and query feature that has to be contributed to oneM2M with the help of the supporting companies.

All the contributions and discussions with oneM2M will be collected and documented in deliverable DMI/SMARTM2M-123154 (MISCELLANEOUS WORK ITEM)/D5. |
| **Interactions** | ETSI TC SmartM2MoneM2MW3COther ETSI committees and groups (e.g. TC SmartBAN, ISG CIM). |
| **Resources required** | Technical knowledge on semantic, discovery, SAREF; W3C, oneM2M. |

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| **Task # 2** | **Discovery and Query solutions analysis and selection** |
| **Objectives** | A study phase where possible approaches (existing and new ones) to a discovery and Query including data aggregation solution will be analysed with respect to the use cases and requirements. In particular the need to plug in the solution on the oneM2M standard will drive the solution analysis, to determine the best approach to be followed. The activity will also look to the query and discovery mechanisms already available, starting from the ones defined by ETSI (e.g. the one included in NGSI-LD) to extract (and potentially adapt) the applicable components and to assure a smooth interworking with non-oneM2M solutions.  |
| **Input** | * TC SmartM2M DTR/SMARTM2M-103714 (TR 103 714)/D1, intermediate and final results.
* The architectures, the functionality and the solutions contained in the deliverables identified in clause 4.1. of this ToR (Base documents).
* Other potential solutions identified by the STF
* The intermediate results of task # 3 in terms of simulations.
 |
| **Output** | * ETSI TC SmartM2M DTR/SMARTM2M-103715 (TR 103 715)/D2.
* The relevant approaches will be presented and discussed with oneM2M to consolidate a shared view to be developed in the STF.

The contributions and discussions with oneM2M will be collected and documented in deliverable DMI/SMARTM2M-123154 (MISCELLANEOUS WORK ITEM)/D5. |
| **Interactions** | ETSI TC SmartM2MoneM2M |
| **Resources required** | Technical knowledge on semantic, discovery, SAREF; W3C, oneM2M. |

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| **Task # 3** | **Discovery and Query solution(s) simulation and evaluation** |
| **Objectives** | A simulation activity (ad hoc or programmable discrete event simulators) to provide a proof of concept and a performance evaluation to support the selection/development of the Discovery and Query solution. It includes the selection of the simulation approach and the simulation tools. |
| **Input** | * Deliverable DTR/SMARTM2M-103714 (TR 103 714)/D1, intermediate and final results.
* Deliverable DTR/SMARTM2M-103715 (TR 103 715)/D2, intermediate and final results (i.e. the intermediate and final results of task # 2 in terms of solution(s) identification)
* The architectures, the functionality and the solutions contained in the deliverables identified in clause 4.1. of this ToR (Base documents).
 |
| **Output** | The simulator/emulator and the simulation results that will be documented in Deliverable DTR/SMARTM2M-103716 (TR 103 716)/D3. An extract of the simulation results to be included in Deliverables DTR/SMARTM2M-103715 (TR 103 715)/D2 and DTR/SMARTM2M-103717 (TR 103 717)/D4, and to be used to support the discussion and the proposal with oneM2M (documented in deliverable DMI/SMARTM2M-123154 (MISCELLANEOUS WORK ITEM)/D5).  |
| **Interactions** | ETSI TC SmartM2MoneM2M |
| **Resources required** | Technical knowledge on semantic, discovery, SAREF; W3C, oneM2M. Expertise in simulation and simulation tools. |

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| **Task # 4** | **Discovery solution specification development** |
| **Objectives** | The standardization of the discovery solution resulting from the selection in task 2 and the simulation results of task 3. It will be discussed with oneM2M, documented in TC SmartM2M and contributed to oneM2M for inclusion in the oneM2M specifications, |
| **Input** | * Deliverable DTR/SMARTM2M-103714 (TR 103 714)/D1
* Deliverable DTR/SMARTM2M-103715 (TR 103 715)/D2, intermediate and final results (i.e. the intermediate and final results of task # 2 in terms of solution(s) identification)
* Deliverable DTR/SMARTM2M-103716 (TR 103 716)/D3, intermediate and final results (i.e. the intermediate and final results of task # 2 in terms of solution(s) identification)
* The architectures, the functionality and the solutions contained in the deliverables identified in clause 4.1. of this ToR (Base documents).
 |
| **Output** | * Deliverable DTR/SMARTM2M-103717 (TR 103 717)/D4.
* Contribution to oneM2M TS-0001 (Architecture), TS-0034 (Semantic support), TS-0033 (Interworking Framework), oneM2M TS-0004 (Protocols) (other TS may be also impacted) with the help of the supporting companies active in oneM2M. All the contributions and discussions with oneM2M will be collected and documented in deliverable DMI/SMARTM2M-123154 (MISCELLANEOUS WORK ITEM)/D5.
 |
| **Interactions** | ETSI TC SmartM2MoneM2M |
| **Resources required** | Technical knowledge on semantic, discovery, SAREF; W3C, oneM2M.  |

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| **Task # 5** | **Contribution to oneM2M** |
| **Objectives** | Contribute to oneM2M on the basis of the results of tasks 1,2,3, with the support of the supporting organizations. |
| **Input** | * The results of tasks 1,2,3,4
* Indications form TC SmartM2M
* Input form the supporting companies
* Indications from oneM2M management
 |
| **Output** | The following is expected:* Contribution and discussion of a Work item proposal on discovery with oneM2M TP
* Contribution and discussion of use cases and requirements with oneM2M TP WG1
* Discussion of selection of the Discovery and Query solution with oneM2M TP WG2 including the supporting simulation/evaluation results
* Contribution and discussion of the selected Discovery and Query solution with oneM2M TP

All according to oneM2M releases schedule |
| **Interactions** | ETSI TC SmartM2MoneM2M |
| **Resources required** | Technical knowledge on semantic, Discovery, SAREF; W3C, oneM2M.All the STF members are expected to participate to this task. |

## Milestones

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| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| A | Progress report approved by TC SmartM2M#53. | 2020-04-30 |
| B | Deliverable DTR/SMARTM2M-103714 (TR 103 714) and Progress report approved by TC SmartM2M#54.Technical contributions reviewed by TC SmartM2M.Use cases and requirements contributed to oneM2M. | 2020-06-30 |
| C | Deliverable DTR/SMARTM2M-103715 (TR 103 715) and Progress report approved by TC SmartM2M#55.Semantic queries and discovery approaches available for review by TC SmartM2M and discussed with oneM2M. | 2020-09-30 |
| D | Deliverable DTR/SMARTM2M-103716 (TR 103 716) and Progress report approved by TC SmartM2M by RC.Semantic queries, discovery solution simulator and evaluation developed and related results reviewed by TC SmartM2M and contributed to oneM2M. | 2021-02-28 |
| E | Deliverable DTR/SMARTM2M-103717 (TR 103 717) and Final report approved by TC SmartM2M by RC.Semantic queries and discovery solution reviewed by TC SmartM2M and contributed to oneM2M. | 2021-05-28 |
| F | All Deliverables published, STF closed | 2021-06-30 |

## Task summary

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| --- | --- | --- | --- |
| **Code** | **Task / Milestone**  | Target Date | Estimated Cost (EUR) |
| From | To |
|  | Start of work | 2020-02-06 |  |  |
| Milestone A | Progress report approved by TC SmartM2M#53. |  | 2020-04-30 |  |
| T0 | STF management | 2020-02-06 | 2021-06-30 | 8 000 |
| T1 | Task 1 – Use case and requirements | 2020-02-06 | 2020-06-30 | 10 000 |
| Milestone B | Deliverable DTR/SMARTM2M-103714 (TR 103 714) and Progress report approved by TC SmartM2M#54.Technical contributions reviewed by TC SmartM2M.Use cases and requirements contributed to oneM2M. |  | 2020-06-30 |  |
| T2 | Task 2 – Discovery and Query options analysis and selection | 2020-02-06 | 2020-09-30 | 20 000 |
| Milestone C | Deliverable DTR/SMARTM2M-103715 (TR 103 715) and Progress report approved by TC SmartM2M#55.Semantic queries and discovery approaches available for review by TC SmartM2M and discussed with oneM2M. |  | 2020-09-30 |  |
| T3 | Task 3 – Discovery and Query solution(s) simulation and evaluation | 2020-04-01 | 2021-02-28 | 30 000 |
| Milestone D | Deliverable DTR/SMARTM2M-103716 (TR 103 716) and Progress report approved by TC SmartM2M by RC.Semantic queries, discovery solution simulator and evaluation developed and related results reviewed by TC SmartM2M and contributed to oneM2M. |  | 2021-02-28 |  |
| T4 | Task 4 – Discovery and Query solution development | 2020-07-01 | 2021-04-30 | 20 000 |
| Milestone E | Deliverable DTR/SMARTM2M-103717 (TR 103 717) and Final report approved by TC SmartM2M by RC.Semantic queries and discovery solution reviewed by TC SmartM2M and contributed to oneM2M. |  | 2021-05-28 |  |
| T5 | Task 5 – Contribution to oneM2M | 2020-04-30 | 2021-05-28 | 18 000 |
| MilestoneF | All Deliverables published, STF closed |  | 2021-06-30 |  |
|  | **106 000** |

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| **Task/ Mil.** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** | **A** | **M** | **J** |
| MA |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MB |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MC |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |
| T3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MD |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |
| T4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ME |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |
| T5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MF |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |

# Expertise required

## Team structure

(Up to) 3 providers (including the one of the STF leader) to ensure the following mix of competences:

|  |  |
| --- | --- |
| **Priority** | **Qualifications and competences** |
| High | Discovery and query mechanisms |
| High | SAREF & semantic query languages  |
| Medium | oneM2M (expected to be complemented by TC SmartM2M stakeholders) |
| Medium | IoT vertical sectors (expected to be complemented by TC SmartM2M stakeholders) |
| Low | Big data collection |

Part IV: STF performance evaluation criteria

# Performance Indicators

|  |
| --- |
| **Select relevant Performance indicators applicable for these ToR (X)** |
| 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) | X |
| Number of delegates directly involved in the review of the deliverables | X |
| Contributions/comments received from the reference Reference Bodies | X |
| Contributions/comments received from other Reference Bodies | X |
|  |  |
| **Contribution from the STF to ETSI work** |
| Contributions to Reference Body meetings (number of documents / meetings / participants) | X |
| Contributions to other Reference Bodies | X |
| Presentations in workshops, conferences, stakeholder meetings |  |
|  |  |
| **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 |  |
| 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 | 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 |
|  |  |

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 shall 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 | 2019-08-21 | SmartM2M | agreed |  |
| 0.1 | 2019-08-29 | SmartM2M | agreed |  |
| 0.2 | 2019-09-10 | SmartM2M | Reviewed at SmartM2M#51 | Final version for final revision and approval |
| 0.3 | 2019-09-10 | SmartM2M | Approved | SmartM2M#51 edited by ETSI for OCG/Board review |
| 0.4 | 2019-09-12 | Youssouf Sakho | TC Approved | Editorials before BOARD/OCG consultation |
| 0.5 | 2019-11-12 | Youssouf Sakho | Board approved | Update before CL publication |
| 0.6 | 2020-01-06 | Youssouf Sakho | Board approved | Update before CL publication with extension of notice period |
| 0.7 | 2020-01-29 | Youssouf Sakho | Board approved | Update following Preparatory Meeting |