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| ETSI_logo_Office_Colour_Small | ***ToR STF 513 (TC SmartM2M)*** |
| Version: 0.7 |
| Author: SmartM2M – Date:14 Dec 2015 |
| Last updated by Alberto Berrini – Date: 16-Mar-2016 |
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Terms of Reference - Specialist Task Force

STF 513 (TC SmartM2M)

”Maintenance & Evolution of SAREF Reference Ontology”

**Summary information**

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| --- | --- |
| Approval status | Approved by Board#106 |
| Time scale | April 2016 to Dec 2016 |
| Work Items | * DTR/SmartM2M-103272SAREF-EXT-INV SmartM2M; Smart Appliances SAREF extension investigation * DTS/SmartM2M-103271SAREF-EXT-EXT SmartM2M; Smart Appliances SAREF extension and oneM2M mapping |
| Board priority category | - Emerging domains for ETSI  - Standards enablers/facilitators (e.g. conformance test/interoperability/methodology) |

Part I – Reason for proposing the STF

# Rationale

On the 26th of November 2015, a new European standard for smart appliances has been published by ETSI TC SmartM2M.

This standard is currently including TS 103 264 (Smart Appliance Common Ontology and oneM2M mapping) and the TS 103 267 Smart Appliances Application of oneM2M Communication Framework and will be integrated with a testing specification in 2016.

The standard is based on the Smart Appliance REFerence ontology (SAREF) a process which has been launched by the European Commission, DG Connect. The EC, as a first step, saw an immediate need of the current market to reduce the energy utilization by managing and controlling Smart Appliances (for example in a house or an office building) on a system level. In particular the Industry and the European Commission raised the need of a common architecture with standardized interfaces and a common data model to assure interoperability. Without these two components, the current market would continue to be fragmented and powerless. Therefore, the development of a reference ontology was targeted as the main interoperability enabler appliances relevant for energy efficiency and ETSI accepted to cover the communication aspect and provide the necessary standardization process support.

Following a broad consultation with stakeholders and addressing clear market needs, the European Commission financially supported a study to create a language (so-called 'reference ontology') for smart appliances. TNO performed the study (SMART 2013/0077) to create the first version of SAREF, which was completed on April 1st 2015. The outcomes of the study were then transferred to ETSI, to turn the study outcome into a Technical Specification. This task has been executed by ETSI TC SmartM2M.

This ETSI standard defines a new reference conceptual language for energy-related applications. This language will be used by the devices in the home (from lamps and consumer electronics to white goods like dishwashers) to allow them to exchange information with any energy management system (which could physically be in the home or in the cloud).

SAREF will enable demand-response to flourish, will bring additional energy and cost savings for building owners and users, and will foster new markets. The intention is to build on converging standardization work and on the development of open platforms on which technologies and solutions will co-exist and interact across application domains.

# Objective

This initiative has been welcomed by the Smart Appliance Industry which clearly indicates the intention to adopt the SAREF ontology and its related communication framework. Currently the reference ontology covers the needs of smart appliances relevant for energy efficiency, and it needs be expanded to cover to the evolution of current requirements and to include new requirement..

During the four workshops on the subject, organized by ETSI and European Commission between autumn 2014 and spring 2015, the Smart Appliance industry has also expressed the urgent request to extend SAREF in order to fill the gaps of the features that were not yet covered by the first version of the ETSI specifications.

Some organizations like Energy@home, Agora and EEBus also require SAREF to cover other domains besides energy efficiency (e.g. demand and response use cases in a smart grid context=, while other organizations (e.g. AHAM) solutions (not included in the original SAREF study) could add additional information ~~in~~to the ETSI SAP specifications.

The proposed work of this STF is to extend SAREF standard taking into account:

* Energy demand/response use casesas defined by Energy@Home and EEBus and taking into account in the SAREF4EE extension created by TNO
* Remarks and comments made by parties that started working with SAREF. SAREF extension will cover the energy domain and at least one additional domain, possibly in the service area (e.g. logistic, eHealth, transport, agriculture, etc.)
* The Smarthome Device Template of HGI/oneM2M TS-0023 (home appliances abstract informational model)
* A full mapping between the oneM2M base ontology (oneM2M TS-0012) and SAREF

Ontology requirements from other industrial organization may to be identified by the STF and included in SAREF during the study.

Ontology development is a new domain in ETSI standardization processes, so it is proposed to adopt a new working methodology to get closer to the ontology/semantic community.

The project is intended adopt methodologies new for ETSI, such as Agile/Scrum Project management.

In particular, ETSI CTI has built a development platform that is proposed to host and run the evolution of the new SAREF ontology.

# Relation with ETSI strategy and priorities

As a result of an EC proposal made to ETSI Board, Smart Appliances activities have been identified as one of the ETSI 2015 Strategic Topics.

An ad hoc group on the Strategic Topic “Smart Appliances” has then been created to ensure that the organisational aspects of the Smart Appliances activities allow in particular for open, full and equitable cross-industry participation. In close co-ordination with the European Commission DG CNECT the group launches and further strategically conducted the standardization activity in ETSI on this new technological area.

Smart Appliance SAREF ontology evolution and this STF are a direct consequence of the ETSI Board SAP directives, and are in line with the two ETSI Boards categories “Emerging -domains for ETSI” and “Standards enablers/facilitators (conformance testing, interoperability, methodology)”.

This work is presently related strictly with the Board IoT strategy work and is part of its 2016 program of work, referred to as SAREF evolution..

# Context of the proposal

## ETSI Members support (provisional, to be confirmed)

|  |  |  |
| --- | --- | --- |
| **ETSI Member** | **Supporting delegate** | **Motivation** |
| Telecom Italia | Enrico Scarrone | Support the development of IoT and Smart Appliances market via the diffusion of ETSI standards (e.g. oneM2M), Support to EU initiatives in Smart Appliances and IoT area, |
| TNO | Jasper Roes | TNO supports the development of IoT and Smart Appliances market via the diffusion of ETSI standards (e.g. SAREF and oneM2M). Next to that we support EU initiatives in Smart Appliances, Energy Efficiency and IoT area. |
| [Deutsche Telekom AG](https://portal.etsi.org/webapp/TelDir/QueryOrgaInfo.asp?OrgaId=268) | Thomas Kessler | Support the development of IoT and Smart Appliances market via the diffusion of ETSI standards (e.g. oneM2M), Support to EU initiatives in Smart Appliances and IoT area, |
| Huawei Sweden | Francisco da Silva | Support the development of IoT and Smart Appliances market via the diffusion of ETSI standards (e.g. oneM2M), Support to EU initiatives in Smart Appliances and IoT area, |
| BNetzA | Markus Maass | Support the development of IoT and Smart Appliances market via the diffusion of ETSI standards (e.g. oneM2M), Support to EU initiatives in Smart Appliances and IoT area, |
| CNRS | Thierry Monteil | Support the development of IoT and Smart Appliances market via the diffusion of ETSI standards (e.g. oneM2M), Support to EU initiatives in Smart Appliances and IoT area, |
| Orange | Patricia Martigne | Support the development of IoT and Smart Appliances market via the diffusion of ETSI standards (e.g. oneM2M), Support to EU initiatives in Smart Appliances and IoT area, |
| Alcatel Lucent | Omar Elloumi | Support the development of IoT and Smart Appliances market via the diffusion of ETSI standards (e.g. oneM2M), Support to EU initiatives in Smart Appliances and IoT area, |
| Sensinov | Mahdi Ben Alaya | Support the development of IoT and Smart Appliances market via the diffusion of ETSI standards (e.g. oneM2M), Support to EU initiatives in Smart Appliances and IoT area, |

## Market impact

The availability of an extended version of the SAREF ontology will allow implementers of Smart Appliances to fully support the different use cases for the appliances. It will enhance the interoperability between their devices and the devices of other manufacturers and will allow them to broaden their market.

The overall deployment of Smart Appliances will directly lead to a quick adoption of the related M2M ETSI standards as developed by oneM2M. These standards address a multi-billion products potential market.

## Tasks that cannot be done within the TB and for which the STF support is necessary

The SmartM2M members do not have sufficient resources and skills to develop the updated ontology on time, with the required high quality that only the use of ETSI recommended methodologies may bring. The technical competence required to produce the ontology would need the support of an STF that will foster the efficiency and quality of the standardization.

## Related voluntary activities in the TB

The 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 at the Steering Committee and the TS SmartM2M meetings.

## Outcome from previous funded activities in the same domain

None

## Consequences if not agreed

ETSI Smart Appliances standard aims to be deployed in European market in a potential of 250 million European dwellings in a first step, and potential worldwide later. If SAREF is not quickly updated to fulfil the new requirements from Smart Appliances industry, it may have a strong negative impact on the adoption of ETSI SAP standard and consequently on the adoption of the oneM2M IoT communication framework. On the contrary, it will leverage on the Smart Appliance initiative launched by European Commission.

Part II - Execution of the work

# Technical Bodies and other Organizations involved

## Leading TB

TC SmartM2M

## Other interested ETSI Technical Bodies

* oneM2M Partnership Project (including oneM2M TP WG5 MAS Management, Abstraction and Semantics)
* ETSI Board IoT

## Other interested Organizations outside ETSI

* European Commission, DG CNECT

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# Working method/approach

## Organization of the work

The work can be separated in 4 main tasks:

* Task T0: Project Management
* Task T1: SAREF requirements gathering
* Task T2: Production of SAREF extension
* Task T3: SAREF Mapping to oneM2M

## Base documents

|  |  |  |
| --- | --- | --- |
| **Document** | **Title** | **Stable draft** |
| ETSI TS 103 264 | SmartM2M Smart Appliances Common Ontology and oneM2M mapping | Published |
| ETSI TS 103 267 | SmartM2M Smart Appliances - Communication framework | Published |

## Deliverables

|  |  |  |
| --- | --- | --- |
| **Deliv.** | **Work Item code**  **Standard number** | **Working title**  **Scope** |
| D1 | [DTR/SmartM2M-103272SAREF-EXT-INV](https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=48245) | SmartM2M; Smart Appliances;  SAREF extension investigation |
| D2 | [DTS/SmartM2M-103271SAREF-EXT-EXT](https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=47982) | SmartM2M;Smart Appliances;  SAREF extension and oneM2M mapping |

The STF will produce the following deliverables, for TB approval:

* **DTR/SmartM2M-103272SAREF-EXT-INV**

Title: Smart Appliances; SAREF extension investigation

Scope: The proposed work will produce a Technical Report, which will be a study collecting feedback from main actors of the SAP industry (e.g. Energy@Home, EEBus, Agora and AHEM). The purpose is to identify the functionalities missing in SAREF and also new domains. The TR will include also concrete examples showing instantiation of the extended SAREF use cases to these domains.

* **DTS/SmartM2M-103271SAREF-EXT-EXT**

Title: Smart Appliances; SAREF extension and oneM2M mapping

Scope: The proposed work will produce a Technical Specification, which will specify the extension of SAREF to include input from different stakeholders as identified in the DTR/SmartM2M-103272SAREF-EXT-INV.

This extension will be mapped on the oneM2M base ontology.

## Deliverables schedule:

|  |  |
| --- | --- |
| DTR/SmartM2M-103272SAREF-EXT-INV | * Early draft requirements gathering, use cases definition May 2016 * Stable draft excluding instantiation and example July 2016 * Stable draft adding instantiation and example Nov 2016 * Final draft for approval Dec 2016 |
| DTS/SmartM2M-103271SAREF-EXT-EXT | * Early draft initial SAREF improvements July 2016 * Stable draft SAREF extensions and mapping Oct 2016 * Final draft SAREF extensions and mapping Dec 2016 |

## Work plan, time scale and resources

|  |  |  |  |
| --- | --- | --- | --- |
| **N** | **Task / Milestone / Deliverable** | From | To |
| M1 | Start of work |  | |
| T0 | Project management | April 2016 | December 2016 |
| T1 | SAREF requirements gathering | April 2016 | August 2016 |
| T2 | Production of extension of SAREF | May 2016 | December 2016 |
| T3 | SAREF extensions mapping to oneM2M | May 2016 | December 2016 |
| **Total** | | | |

Task 0: Project Management

The project will be organized in an Agile/Scrum way for the sake of efficiency and to foster the quick development of new SAREF ontology

Task 1: SAREF requirements gathering

This task will gather requirements from the main smart appliances industrial actors to be exploited and implemented in the companion DTS/SmartM2M-103271SAREF-EXT-EXT.

* It is intended to collect input and requirement from a large panel of relevant organizations (including Energy@Home, EEBus and AHEM), in particular the Smart Appliances companies. The final list will be agreed upon between ETSI SmartM2M and the STF Leader. The initial work will take ~~in~~ further account of the technical feedback received at the 4 SAP Workshops that were organized by ETSI and European Commission.
* It will analyze the SAREF ontology documentation and define how it should be organized to enable the different industrial domains to use the ontology without having to implement all concepts belonging to other domains.
* It will provide concrete examples on how the SAREF can be instantiated on some use cases (at least two) of these domains, which will highlight the extension proposed.

**Deliverable**: DTR/SmartM2M-103272SAREF-EXT-INV: “Smart Appliances; SAREF extension investigation”. The report will summarize the task results as described above.

Task 2: SAREF extension development

This task will produce an extension of SAREF based on the study described in Technical Report DTR/SmartM2M-103272SAREF-EXT-INV: “Smart Appliances; SAREF extension investigation”

The objective is to include input from the industrial actors of the appliances domain and to add also non energy related aspects. This specification is defined as a delta document extension of TS 103 264.

The produced ontology and his complete description will be included in the deliverable DTS/SmartM2M-103271SAREF-EXT-EXT: “Smart Appliances; SAREF extension and oneM2M mapping”.

Task 3: SAREF mapping to oneM2M

This task will produce a mapping of updated SAREF to the oneM2M base ontology. For the oneM2M base ontology, oneM2M has defined mapping rules that map some key concepts to oneM2M resources, e.g. creating an Application Entity resource for a device like a washing machine and creating containers, e.g. for storing the status of the washing machine. The new SAREF description of the device will be stored in a semantic descriptor child resource of the Application Entity resource representing the device. This will also take into account the oneM2M Home appliances abstract information model TS-0023.

The produced mapping will be included in the deliverable DTS/SmartM2M-103271SAREF-EXT-EXT “Smart Appliances; SAREF extension and oneM2M mapping”.

# Required expertise

## External expertise

The following expertise is required to perform the work:

* Expert knowledge of oneM2M standards, semantics and Smart Appliance domains
* Experience in industry specific ontology development, especially SAREF.

## Working methods

The work must be performed in cooperation by 2 or 3 service providers, which must be prepared to share tasks as required. The actual number of contributors will depend on the mix of skills that will be available from the applications proposed and will be decided by the ETSI Secretariat in consultation with the TC Chairman, when setting up the STF.

In order to address the needs of the SAP Industry, it will be encouraged for organizations and companies in the area of Smart Appliances to apply for voluntary contribution to the work. The purpose is to get a limited team of non-funded experts that represent the different industry domains working of Smart Appliances.

## CTI experts

CTI expertise is requested to contribute to the STF for providing support in the Agile methodology and for managing the software development platform. The CTI contribution is non-funded (out of FWP budget).

# Travel cost

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| --- | --- |
| **Description** | **Cost estimate** |
| STF experts may be required to attend SmartM2M meetings in Europe: SmartM2M#38, SmartM2M#39 and SmartM2M#40, 2 meetings with EC in Brussels and, possibly meetings with stakeholders for requirements collection. | 4 000 |
| **Total cost** | **4 000** |

Part III: STF performance evaluation criteria

# Key Performance Indicators

Key performance indicators suitable for this kind of STF projects are the following:

Contribution from ETSI Members to STF work

* Number and relevance of ontologies solution considered for addition
* Number and relevance of organizations engaged/contacted in the extension
* Voluntary work of experts
* Steering Group meetings (number of participants/duration)
* Delegates attending meetings/events related to STF (number of participants/duration)
* Direct contribution of delegates (e.g. number of documents/comments/e-mail)
* Support to the STF work (e.g., provision of test–beds, organization of workshops, events)

Contribution from STF experts to ETSI work

* Contributions presented to TB/WG meetings (number, type, comments received)
* 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
* Quality review by TB
* Quality review by ETSI Secretariat

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.

## Time recording

The STF expert shall report in the time sheet provided by ETSI, the days spent for the performance of the services.

# Document history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.1 | 14-Dec-2015 | SmartM2M | Draft | First Draft |
| 0.2 | 15-Dec-2015 | SmartM2M | Draft | Updated following review |
| 0.3 | 18-Dec-2015 | SmartM2M | Draft | Updated based on comments at SmartM2M#36 |
| 0.4 | 22-Dec-2015 | SmartM2M | Draft | Including comments from Alberto, Francisco e Jasper, and the addition of Sensinov. |
| 0.5 | 23-Dec-2015 | SmartM2M Chairman | Draft | Including comments from ORANGE/Patricia |
| 0.6 | 03-Feb-2016 | Berrini | CfE | Based upon v0.5 of 23 Dec 2015 |
| 0.7 | 16-Mar-2016 | Berrini | Prep. Meet. |  |