Smart M2M Value and Status

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Agenda

- What is Smart M2M?
- SAREF and its extensions
- How to contribute to SAREF
- Semantic Discovery and Query in oneM2M
- oneM2M Testing
- Other activities: (a) Virtualized IoT; (b) AI/ML for IoT Systems
- SmartM2M current main collaborations and relations in ETSI
WHAT IS TC SMARTM2M?

It is an ETSI center of competence for IoT standardization since 2009. It developed the first IoT service layer specification and promotes its globalization in oneM2M.

TC SmartM2M is currently:

- Supporting the European industry and institutions on the identification and adoption of IoT standards, building a common semantic solution around the oneM2M/SAREF framework, including in AIOTI.

- Bridging the European needs and requirements in the area of IoT, in particular for:
  - Semantic interoperability through SAREF/oneM2M;
  - Security / Privacy.

- Supporting ETSI activities in the IoT area, in collaboration with the other groups (CYBER, SmartBAN, ITS, EMTEL, CIM, etc).

- Supporting oneM2M, in terms of promotion, testing support and pre-standardization.
Universal semantic interoperability SAREF/oneM2M

1) Vertical ontologies support
2) Semantic Support
3) Communication Framework

SAREF and its extensions
IoT base ontology + Data annotation
IoT Data sharing
SAREF/oneM2M and its extensions

ETSI TS 103 264: SAREF and oneM2M Mapping
ETSI TS 103 410 (1-10): SAREF extensions
ETSI TS 103 267: SAREF Communication Framework
ETSI TS 103 268 (1-4): SAREF Test Suite

TS 103 548 SEAS reference ontology patterns

Semantic interoperability

SAREF Core
Energy
Building
Environment
Smart Cities
Industry & Manufacturing
Smart Agriculture
Automotive
E-Health/ Aging Well
Wearables
Smart Water

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01/2017

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Q2/2019

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Q2/2020
SAREF activities overview

SMART 2013/0077 Standardization Initiative
EC & ETSI EC SmartM2M

- Publication of SAREF v1.1.1 as ETSI TS 103 264
- ETSI STF 513
  - SAREF4ENER
  - SAREF4ENVI
  - SAREF4BLDG
- ETSI STF 534
  - SAREF4CITY
  - SAREF4INMA
  - SAREF4AGRI
- ETSI STF 556
  - SAREF Forge
  - SAREF Portal requirements
  - SAREF4SYST
- ETSI STF 578
  - SAREF development framework and workflow
  - SAREF public documentation portal
- Publication of SAREF v3.1.1

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How to contribute to SAREF (1/2)

SAREF specifications are developed and maintained in TC SmartM2M and are dependent of oneM2M - the interworking framework used by SAREF -, under stimulus and support of the EC DG Connect.

The specific ontologies to be integrated in SAREF are developed by the industry stakeholders - by companies, associations, and other SDOs.

The input from the stakeholders has so far been conveyed

- through STFs in 2016-2017-2018-2019 supported by ETSI,
- and in 2019-2020 will be expanded through a new STF supported by EC DG Connect,
- by ETSI members belonging to industry (e.g., Digital SME),
- and through liaisons and inputs received by TC SmartM2M as a group or by participating TC SmartM2M members.
Ontologies are dynamic structures constantly evolving with the technologies and the products, so direct contributions from stakeholders are needed to sustain SAREF evolution.

TC SmartM2M is working on the development of an open portal to gather direct contribution to SAREF, a sort of “open source” project dealing with ontologies instead of source code.

The stakeholders’ data model inputs will then be reflected in the ETSI SAREF and oneM2M specifications by TC SmartM2M.
Towards a Portal to engage stakeholders contributions (1)

STF 556: Consolidation of SAREF and its community of users, based on the experience of the EUREKA ITEA - 12004 SEAS project (June 2018 – June 2019):

Deliverables published

- **D1 TR 103 549** Guidelines for consolidating SAREF with new reference ontology patterns
- **D2 TS 103 548** SAREF consolidation with new reference ontology patterns, based on the experience from the EUREKA ITEA SEAS project
- **D3 TR 103 608** SAREF publication framework reinforcing the engagement of its community of users

Draft of the portal:

- development of SAREF migrated to the ETSI Forge
- 37 issues identified in SAREF, resolutions available, being processed
  [https://forge.etsi.org/rep/SAREF/saref-core/](https://forge.etsi.org/rep/SAREF/saref-core/)
- Proof of concept of the SAREF portal
  [https://saref.etsi.org/](https://saref.etsi.org/)
Towards a Portal to engage stakeholders contributions (2)

- The value of SAREF is strongly correlated with the size of its community of users and the agility of SAREF developers to improve it, reacting to raised issues.

- SAREF users’ community / industry actors need be attracted.

STF 578: Spec. of the SAREF develop. framework and workflow, and develop. of the Community SAREF Portal for user engagement. Sept 2019 – Sept 2020:

- Planned tasks:
  - **TS 103 673** SAREF Development Framework and Workflow, Streamlining the Development of SAREF and its Extensions
  - **SW1** Development of the SAREF Portal Content Generation from the SAREF sources, Enabling Continuous Integration and Deployment of SAREF
  - **SW2** Development of the SAREF Portal Interaction Functionalities, Reinforcing the Engagement of its Community of Users
Semantic Discovery and Query in oneM2M

- This new activity, to be accomplished by an STF, beginning in 2020, will consist of studying and developing semantic Discovery and Query capabilities for oneM2M.

- The goal is to enable an efficient discovery of information and a proper interworking with external source/consumers of information or to directly search information in the oneM2M system for big data purposes.

- The intention is to reuse SAREF in the context of the discovery and communication of aggregated data to assure a smooth interoperability with external sources/consumers.

- The activity will look to the query and discovery mechanisms available, starting from the ones defined by ETSI (e.g. the one included in NGSI-LD).

- 4 WIs - one for each of the phases (requirements, study, simulation and standardisation); 1 WI - for the contributions and discussions with oneM2M.
oneM2M Testing

- TC SmartM2M is supporting the development of oneM2M test suites housing Special Task Forces and coordinating their effort in collaboration with ETSI CTI and oneM2M, enabling the development of oneM2M Certification programs and the execution of Interoperability Events.

- STF 531 completed in 2018 the development of the testing suites for Release 2 of oneM2M.

- STF 559 started in 2018 with the target to complete by end 2019 the development of the testing suites for Release 2A and Release 3 of oneM2M.

- STF 559_ONEM2M started in Dec. 2018 with the target to complete by Jan 2020 the development of the testing suites for Release 4 of oneM2M.

Test descriptions and priorities

Formal Test Suites

Certification

Interop events

https://portal.etsi.org/STF/stfs/STFHomePages/STF531
https://portal.etsi.org/STF/stfs/STFHomePages/STF559
https://portal.etsi.org/STF/STFs/STF-HomePages/STF559_ONEM2M
STF 547 Security/Privacy and Interoperability of Standard IoT Platforms

This work is developed by a Specialist Task Force supported by the EC

STF 547 - Security/Privacy and Interoperability of Standard IoT Platforms
https://portal.etsi.org/STF/STFs/STF-HomePages/STF547

Scope includes Privacy and Security for IOT, and on IOT guidelines for interoperability at platform and semantic level
Final results foreseen by the end of 2019

TR 103 533 "SmartM2M; Security; Standards Landscape and best practices"
TR 103 591 "Privacy study report; Standards Landscape and best practices"
TR 103 534-1 "SmartM2M; Teaching material; Part 1: Security"
TR 103 534-2 "SmartM2M; Teaching material; Part 2: Privacy"
TR 103 535 "SmartM2M; Guidelines for using semantic interoperability in the industry"
TR 103 536 "SmartM2M; Strategic/technical approach on how to achieve interoperability/interworking of existing standardized IoT Platforms"
TR 103 537 "SmartM2M; Plugtests™ preparation on Semantic Interoperability"

DSR/SmartM2M-003680 SmartM2M; Guidelines for Security, Privacy and Interoperability in IoT System Definition; A Concrete Approach
• Dedicated to all stakeholders
• Based on the analysis of relevant use cases
Other activities

Architecture and Components for Virtualized IoT- STF 535
- TR 103 523 Landscape for open source and standards for cloud native software applicable for a Virtualized IoT service layer
Published 2018/08

Artificial Intelligence for IoT Systems
- TR 103 674 - Architecture AI4IoT
- TR 103 675 - PoC AI4IoT
Publication Planned Q4 2020

The objective 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
SmartM2M current main collaborations and relations in ETSI

- TC ITS
- TC CYBER
- EP eHealth
- ISG CIM
- SC EMTEL
- TC SmartBAN

Relations:
- ITS interworking
- oneM2M Integration and overlapping avoidance
- SAREF for eHealth and Aging-Well
- Security Privacy
- IOT in emergency situations
- SAREF Wearables
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