Welcome to the World of Standards

SAREF ONTOLOGY & ROADMAP
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ETSI IoT Week 2017, Sophia Antipolis, 24 October 2017
Standardization in IoT has largely focused at the technical communication level, leading to a large number of different solutions based on various standards and protocols

- Widespread fragmentation in current market and technology
- Existing IoT solutions are characterized by non-interoperable concepts, and cannot integrate with one another as wished
- Interoperability is key to unlock the full potential of IoT
In 2013 the European Commission launched a standardization initiative (SMART 2013/0077) in collaboration with ETSI TC SmartM2M

- Create a commonly agreed semantics (interoperable concepts) for the smart appliances domain
- Build a reference ontology (SAREF) as “interoperability language”

SAREF study conducted by TNO from January 2014 to March 2015
- [www.sites.google.com/site/smartappliancesproject](http://www.sites.google.com/site/smartappliancesproject)
SAREF

First ontology standard in the Internet of Things (IoT) ecosystem*

Developed in close interaction with the industry

https://w3id.org/saref

*source: EC Rolling Plan for ICT Standardisation 2016/2017
The outcome of the Smart Appliances study resulted in the publication of the SAREF standard by ETSI in November 2015.

In 2016, ETSI requested a Specialist Task Force (SFT 513) on the management of SAREF and creation of extensions in specific domains.

In January 2017, the first 3 extensions were published: SAREF for Energy, SAREF for Environment and SAREF for Buildings.

SAREF SPECIFICATIONS

- SAREF version 2 Technical Specification: [TS 103 264 V2.1.1](#)
- SAREF extension investigation Technical Report: [TR 103 411](#)
- SAREF for Energy (SAREF4ENER) Technical Specification: [TS 103 410-1](#)
- SAREF for Environment (SAREF4ENVI) Technical Specification: [TS 103 410-2](#)
- SAREF for Buildings (SAREF4BLDG) Technical Specification: [TS 103 410-3](#)
In 2016, the EC launched a follow-up study on interoperability for Demand Side Flexibility (SMART 2016/0082)

- Timeline: February 2017 – December 2017
- Study Team: TNO, ESMIG and DNV-GL
STATE OF STANDARDIZATION FOR DSF

- Identify gaps in standardization for DSF
- Recommend alignments needed to achieve interoperability for DSF, especially in relation to SAREF and SAREF4ENER
SAREF FOR ALIGNMENT

- CIM/OpenADR for Demand Response
- oneM2M for underlying communication
- SAREF
- SAREF 4ENER
- COSEM for metering
- SPINE for smart appliances
- oneM2M for underlying communication
DEMONSTRATION: TOWARDS A COMMON LANGUAGE FOR DEMAND SIDE FLEXIBILITY

Dataflow 1: Home appliances control

Dataflow 2: Smart meter data reporting

First implementation of seamless interoperability for DSF using ETSI SAREF & oneM2M, together with CEN/CENELEC and IEC standards

European Utility Week, Amsterdam, 3-5 October 2017

ETSI IoT Week, Sophia Antipolis, 23-26 October 2017

SAREF Event@ DG CONNECT, Brussels, 27/28 November 2017
ONEM2M - SAREF(4ENER) - SPINE

Gateway

Management / Algorithms

SAREF4ENER/oneM2M resource
oneM2M
oneM2M protocol

public

SAREF4ENER/SPINE resource
SPINE
SPINE protocol

SAREF4ENER/SPINE resource
SPINE
HTTP protocol

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A multitude of other domains such as Smart Cities, Smart AgriFood, Smart Industry & Manufacturing, Automotive, eHealth/Ageing-well and Wearables, are currently on the roadmap turning SAREF into “Smart Anything REFerence ontology”, which enables better integration of semantic data from various vertical domains in the IoT.
ETSI has recently started the STF 534 for SAREF extensions to Smart Cities, Smart AgriFood, Smart Industry & Manufacturing

- Timeline: October 2017- April 2019
- Expert team: TNO and UPM
Deliverables

- 3 ETSI Technical Reports (one per domain)
  - Scope: determine the requirements from the considered domains, collect use cases and identify available existing data models/standards
  - Timeline: October 2017- June 2018

- 3 ETSI Technical Specifications (one per domain)
  - Scope: specify initial extensions to SAREF based on the requirements expressed in the corresponding TR
  - Timeline: April 2018 - April 2019
Consultation and involvement of stakeholders is key to ensure that the new SAREF extensions are supported from beginning of their development and subsequently adopted by industry.

STF 534 is seeking input from industry, standardization bodies, AIOTI, H2020 LSPs, etc.

- Data models, Standards, Use cases

in the following domains

- Smart Cities, Smart AgriFood, Smart Industry & Manufacturing
Thank you for your attention!