



The Standards People

Introduction to oneM2M

Colloque Sicoval/eG4U – Labège

Un numérique responsable au service de territoires plus durables



UNION EUROPÉENNE



Presented by Xavier PIEDNOIR

About the oneM2M global partnership



A global partnership among SDOs and Industry Associations/Fora

Main goal: create consistency in how devices, servers and applications communicate through a standardized M2M Service Layer

- Interoperability
- Cost-effectiveness / economies of scale
- Reduced fragmentation
- Larger market



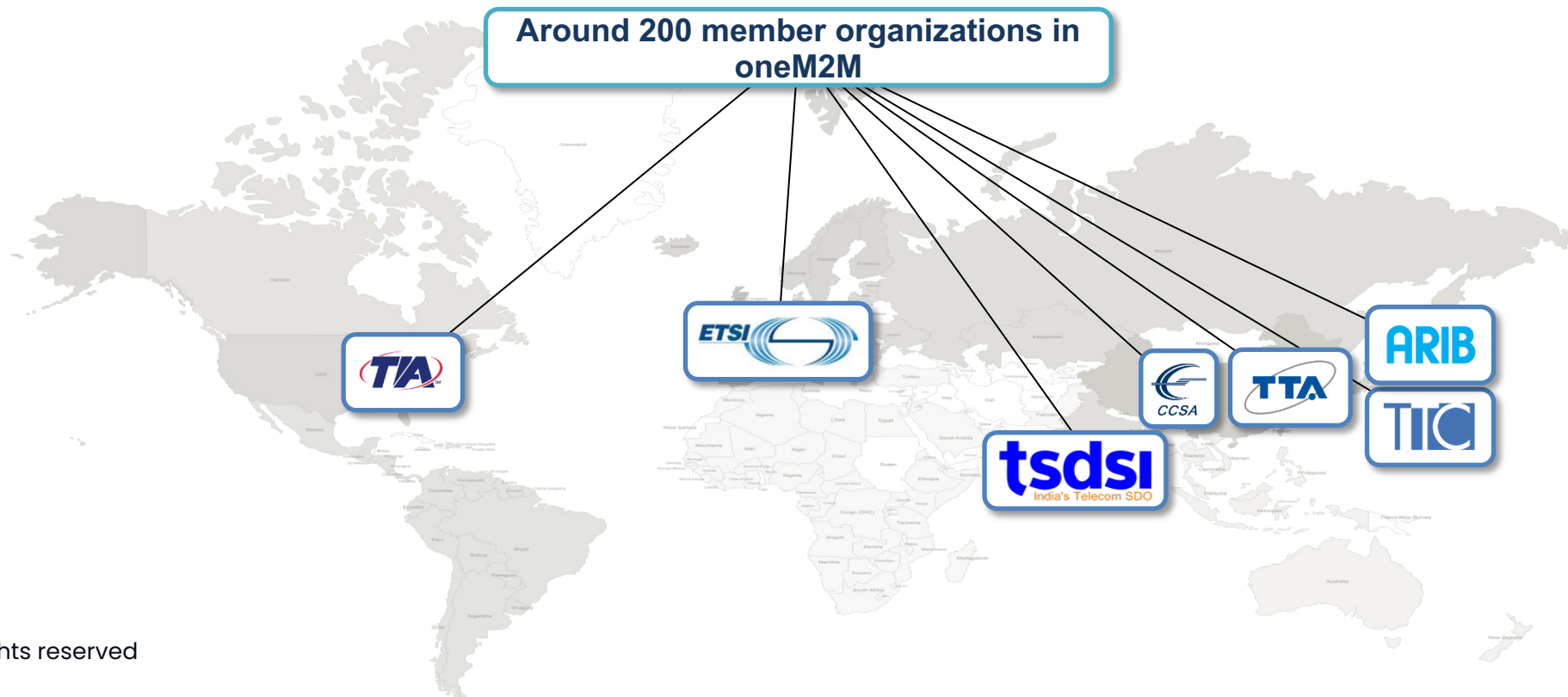
Open and transparent: all working documents are public.
All deliverables available free of charge

Detailed scope at <http://www.onem2m.org/>

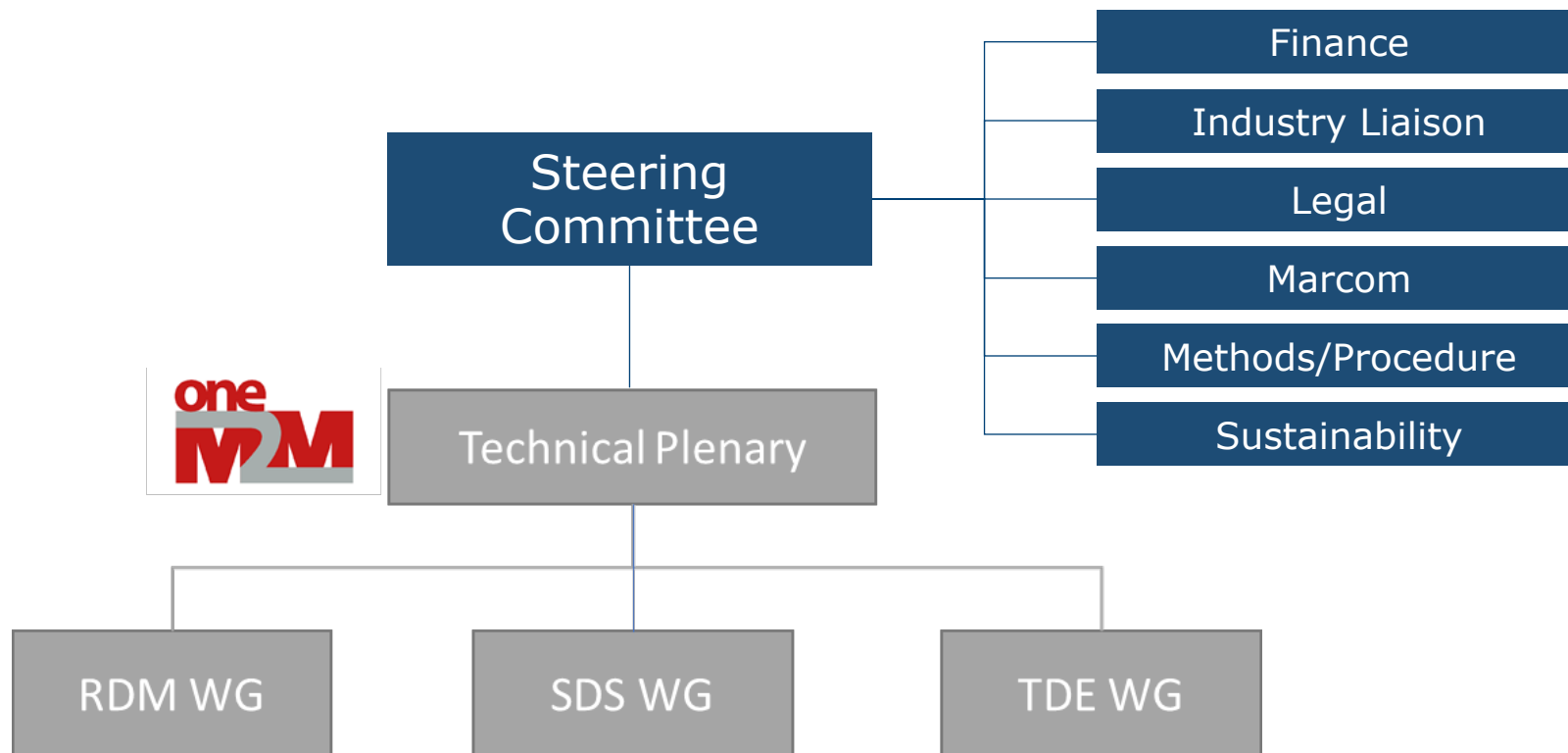
Global Participants, Global Footprint



- Global footprint established through regional presence
- ETSI is the partner in Europe, your contact point to get involved in oneM2M
- Formal International recognition with transposition by ITU-T under the Y.4500 series
 - National adoptions in India and Korea

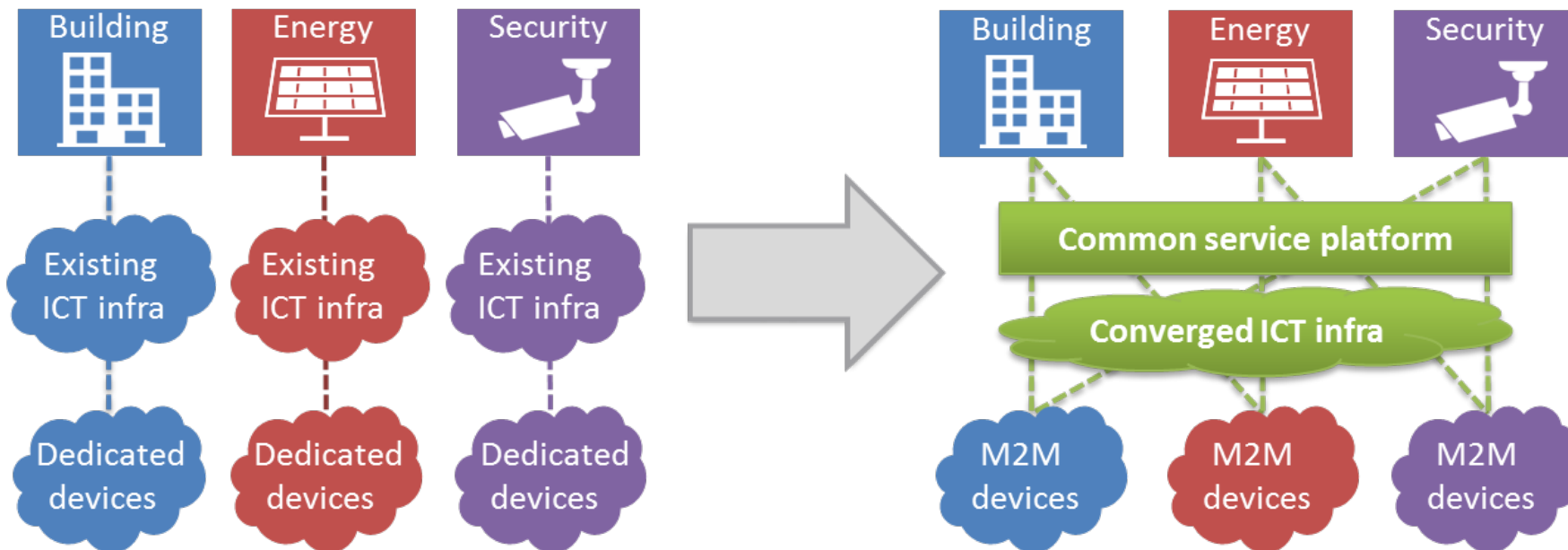


Partnership Project Structure



RDM: Requirements and Domain Models
SDS: System Design and Security
TDE: Testing and Developers Ecosystem
ACR Ad-Hoc Group: Academia Relations

Breaking barriers: cross-domain interoperability

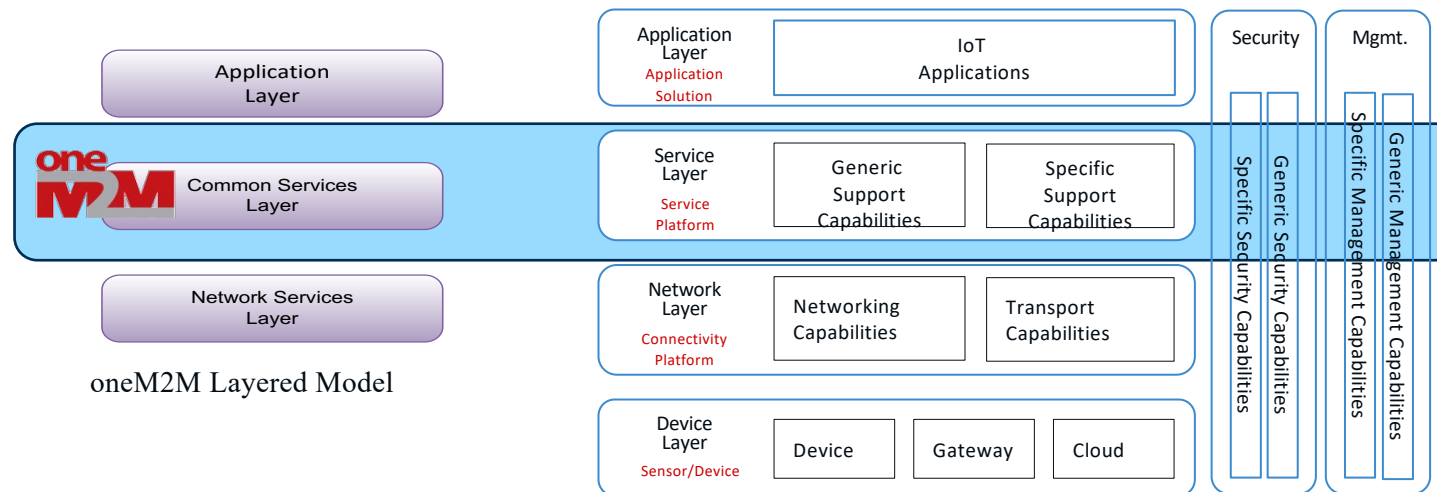


- Highly fragmented market with small vendor-specific applications.
- Reinventing the wheel: Same services developed again and again.
- Each silo with its own technologies without interoperability.

- End-to-end platform: common service capabilities layer.
- Interoperability at the level of communications and data.
- Seamless interaction between heterogeneous applications and devices.

oneM2M technical approach 1/3

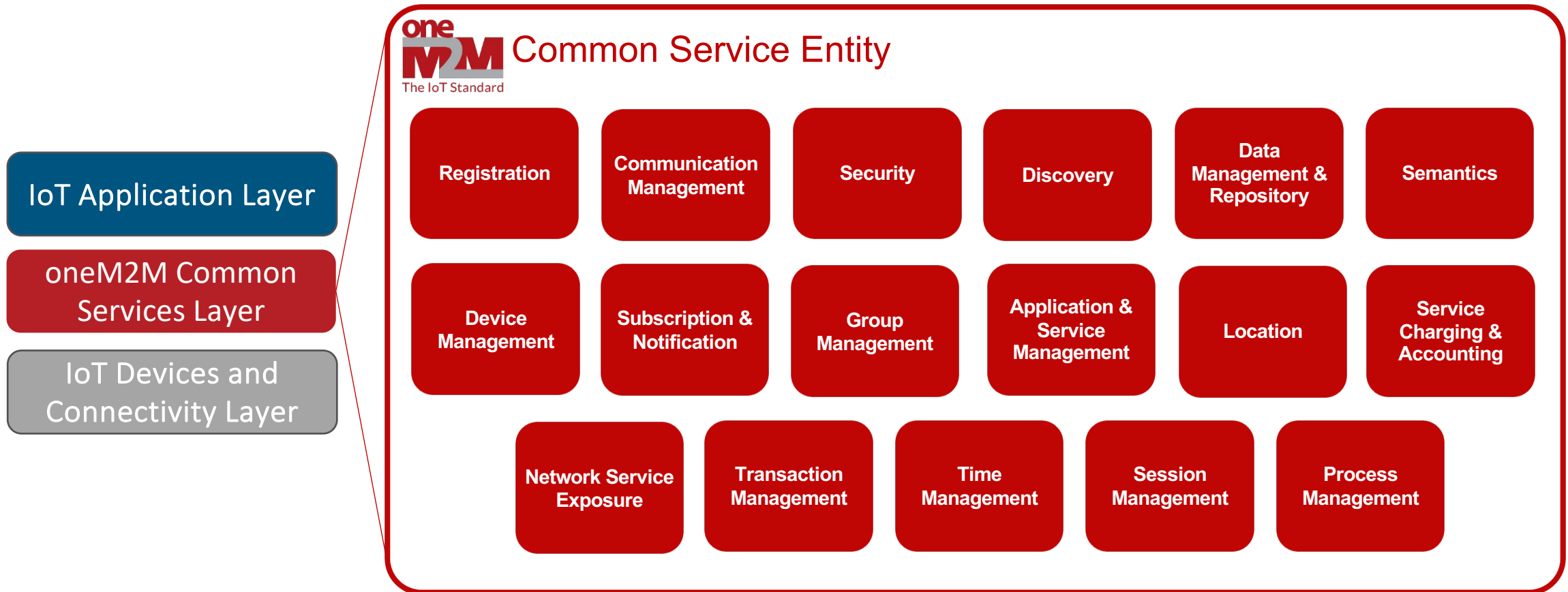
- oneM2M provides IoT middleware and its APIs
 - so application developers focus on service logics
 - while they use oneM2M APIs instead of implementing those common functions by themselves
 - e.g. data management, group access, device management, location
 - and is transport agnostic over IP covering HTTP, CoAP, MQTT and WebSocket



ITU-T Y.4000 IoT Reference Model

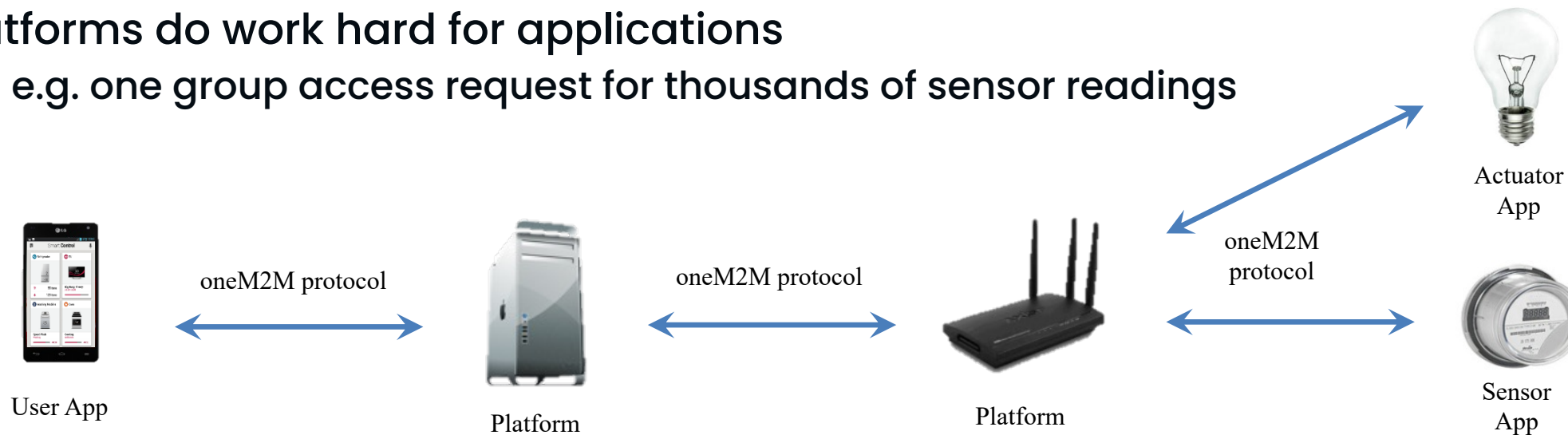
oneM2M technical approach 2/3

- oneM2M provides a Common Services "Toolkit"



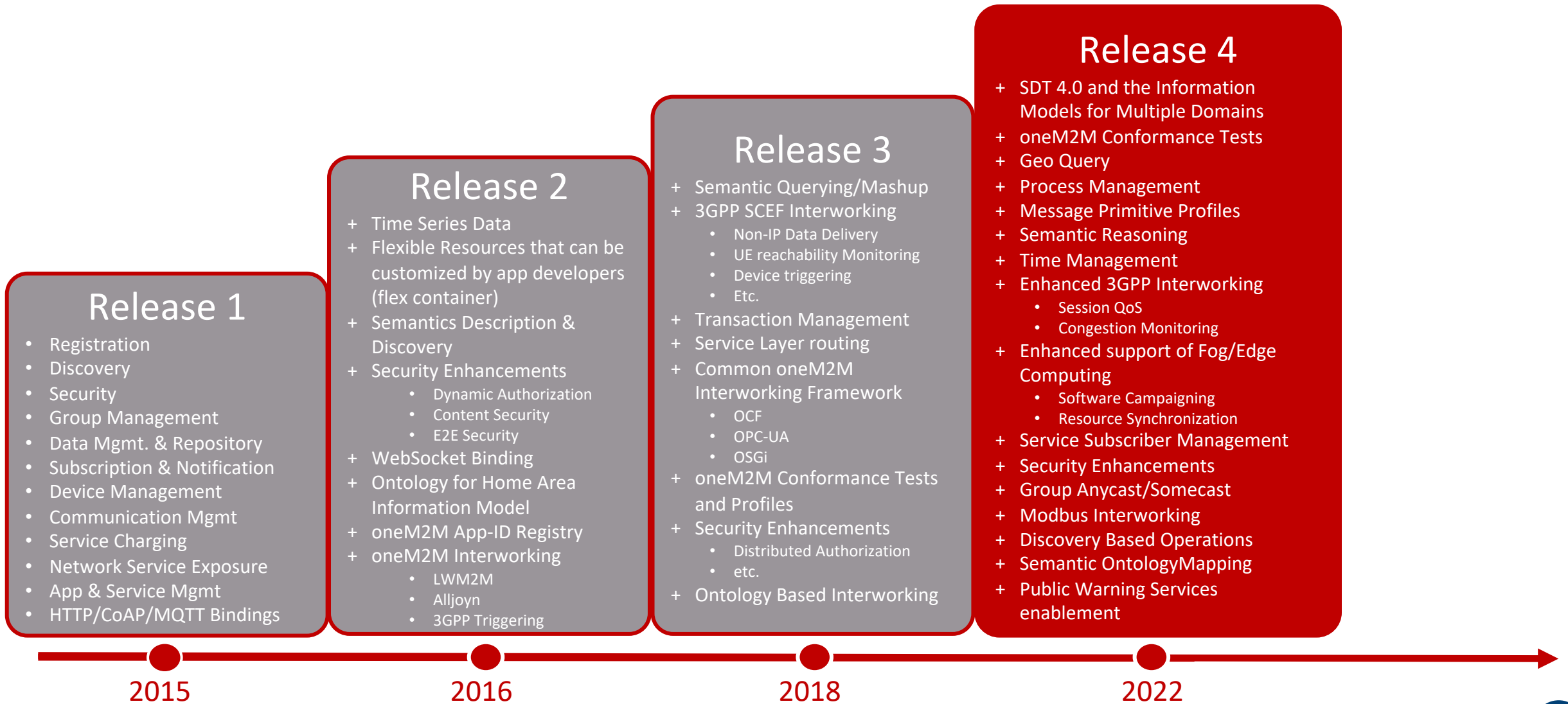
oneM2M technical approach 3/3

- In oneM2M, platforms do help applications
 - one or more server/gateway/device server(s) deployed
 - cloud vs. edge/fog
 - applications can exchange data via platform with rich functionalities
 - data is stored in platform(s)
 - platforms do work hard for applications
 - e.g. one group access request for thousands of sensor readings



< An example of oneM2M system >

oneM2M releases at a glance



Studies, Use Case and Requirements development

- AI enablement
- Information Model enhancements – SDT4.0
- Support of Data Protection Regulations
- Support of Data License Management
- Smart City and Enterprise domain enablement enhancement
- Enablement of IoT in the metaverse
- Advanced Semantic Discovery
- Additional Interworkings (e.g. OGC's Sensor Thing API)
- Effective IoT Communication to Protect 3GPP Networks (cont'd)
- Digital Twins Enablement in oneM2M
- Integrating NGSI-LD API in oneM2M

TECHNICAL REPORTS

REQUIREMENTS
TS-0002

TECHNICAL SPECS

A complete package: from architecture to testing



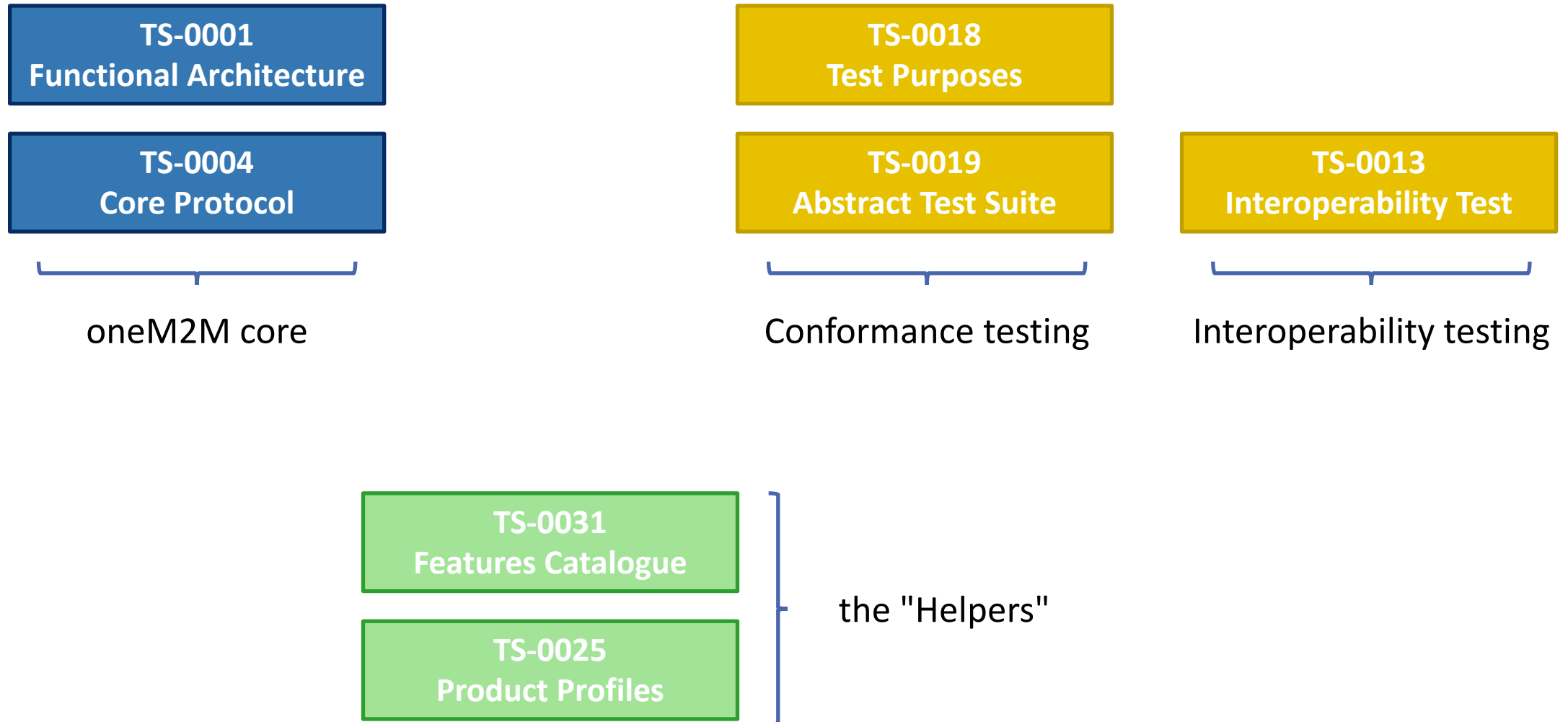
oneM2M strives to deliver a consistent set of specifications matching the development process:

- Requirements
- Architecture
- Technical Solution
- Testing
- Guides for implementers and developers

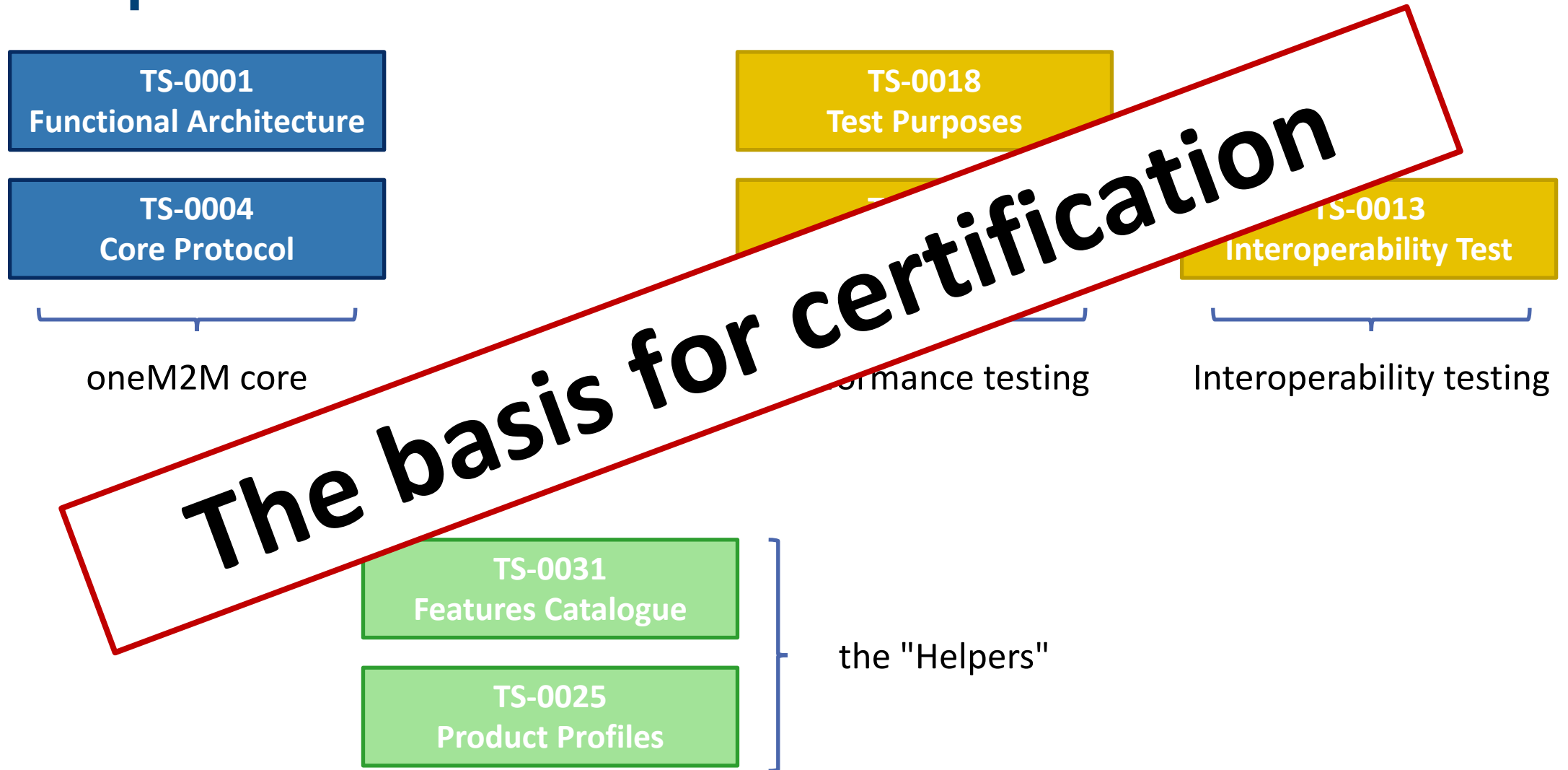
About testing:

- Testing is at the core of quality control when developing and deploying a product.
- oneM2M offers two sets of testing specifications:
 - Conformance testing: to verify compliance of an implementation with the specifications
 - Interoperability testing: to verify if and how multiple devices from multiple vendors work together

Overview of the oneM2M test specifications



Overview of the oneM2M test specifications



oneM2M certification program



All the oneM2M testing material provides a strong foundation for certification needs

Certification for oneM2M pioneered by TTA in Korea in 2016

- A follow-up to the national adoption of oneM2M
- Certification needed in support of several projects nationally

Certification taken to new levels with partnership with GCF, leveraging the TTA work

- Birth of the oneM2M Certification Program

Certification re-uses the oneM2M testing material












- If new test cases are needed, they are defined in oneM2M, not in GCF
- GCF was instrumental in steering oneM2M to develop the supporting material
 - Example of the Feature Catalogue and Product Profiles



Open Source Implementations



- Members support different open sources for different dev. environments
 - Different open sources gives better opportunity for standard adoption

	 OM2M Connecting things	 OPEN DAYLIGHT IoTDM	 OCEAN	 OS IoT	 open mtc	 ACME
Lead	 LAAS-CNRS	 CISCO	 KETI	 atis	 Fraunhofer FOKUS	Andreas Kraft
Homepage	www.eclipse.org/om2m	wiki.opendaylight.org/view/IoTDM:Main	developers.iotocean.org	os-iot.org	www.openmtc.org	github.com/ankraft/ACME-oneM2M-CSE
License	EPL 1.0	EPL 1.0	BSD 3-Clause	BSD 3-Clause	EPL 1.0	BSD 3-Clause
Offering	Platform	Platform	Platform, Dev Tools	Lightweight Dev API	Platform	Platform, Dev Tools
Binding	HTTP, CoAP	HTTP, CoAP	HTTP, CoAP, MQTT, WebSocket	HTTP	HTTP, MQTT	HTTP, MQTT
Format	XML, JSON	JSON	XML, JSON, CBOR	XML, JSON	JSON	JSON, CBOR
Language, Framework	Java / OSGi	Java	Node.js, Java	C++	Python	Python 3
Interworking	KNX, ZigBee, HUE, LoRa, SigFox, etc	ZigBee	AllJoyn, OCF, Nest, ZigBee, FIWARE, Jawbone	-	FIWARE, CuI868	AllJoyn, SDT

Support to developers and users



The community strives to ease access to the oneM2M world. It has developed abundant material to that effect:

- Developer Guides
- Video Tutorials
- Wiki

oneM2M also organizes events to support implementers and developers as well as to create awareness in the academic world:

- Tutorials & developer events
- Hackathons
- Interoperability events

This content is freely available at the oneM2M developer resources page:

https://wiki.onem2m.org/index.php?title=Main_Page

Wiki Home Community Development Teaching materials Getting started Hackathons Outreach



Community

- **Open source projects** List of the most well-known open source projects
- **Issues/Questions** raise your question or issue in stackoverflow or in the mailing list

Development

- **oneM2M github**
- **oneM2M URN Namespace**
- **Tools** Useful tools for developers
- **Developer guides**
- **OpenAPI repository** OpenAPI Specification (OAS) for oneM2M API specifications
- **Testing activities**

Teaching materials

- **oneM2M Advanced Tutorial** Full 2-day training to allow to build a complete IoT solution based on oneM2M
- **oneM2M Semantic Tutorial**: An overview of semantics, applied to IoT and how using ontology can considerably enrich IoT applications and use cases.
- **oneM2M Hackster** List of Hackster.io projects based on oneM2M. Some projects have been produced at the oneM2M International hackathon in Fall 2021.
- **IIIT Hyderabad MOOC** @:

Getting started with oneM2M

- **oneM2M Overview**: Overall presentation. Understanding the main concept of oneM2M
- **oneM2M Core functionalities**: Quick description of the Core functionalities.
- **oneM2M Main Features**: Presentation of the main functionalities .

oneM2M Hackathons

- **News**: Details on upcoming oneM2M Hackathons
- **Past events**: Information on past oneM2M Hackathons (awarded projects details, winners, scope,...)

Outreach

- **oneM2M Webinars**: If you wish to know more about oneM2M, you might want to watch the oneM2M webinar videos
- **Other Videos**: See the Media library of oneM2M videos



Thank you for your attention

Any further questions?

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