oneM2M Testing and Certification

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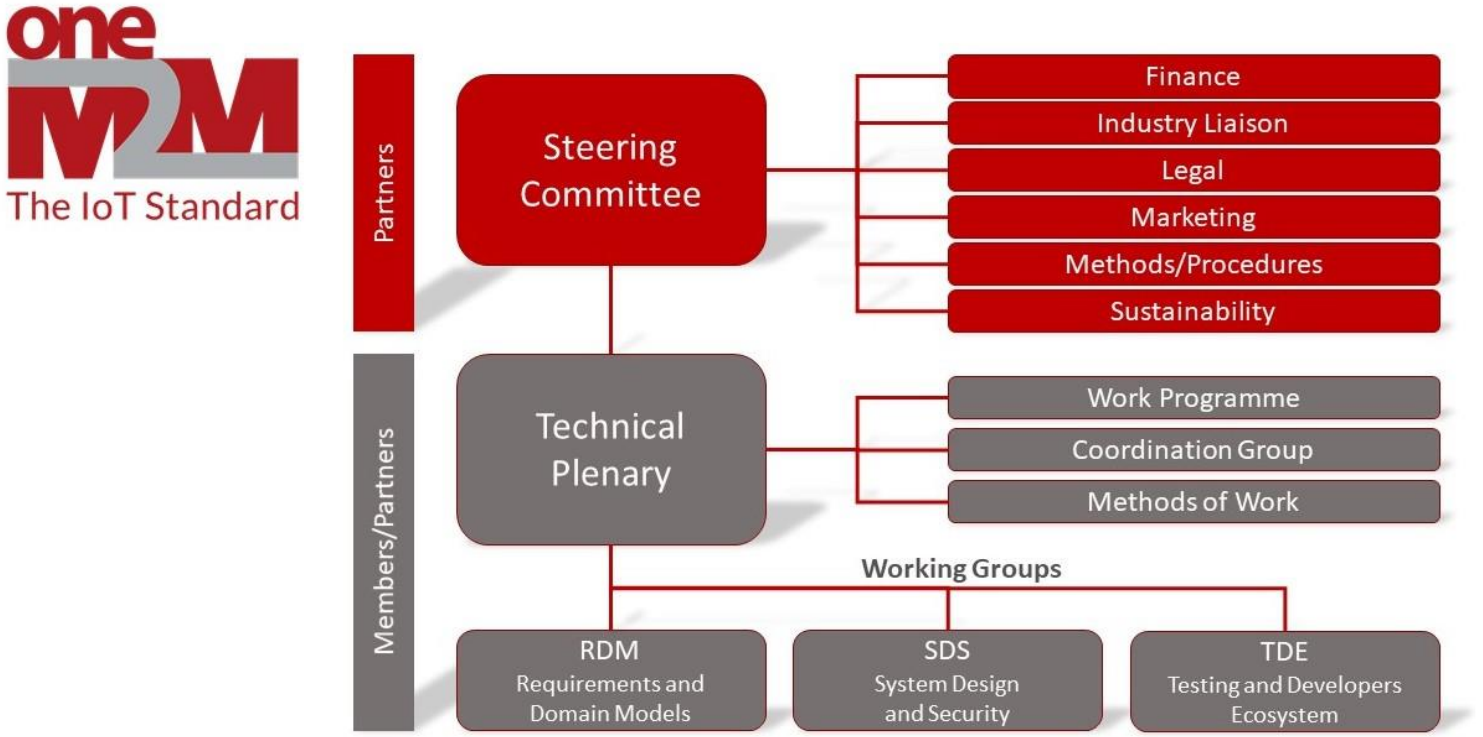
ETSI CTI (Center for Testing and Interoperability)

2025-11

ORGANIZATION



TDE Chair: Bob Flynn, Exacta GSS

WHY TDE WORKING GROUP

- To help stakeholders during their implementation phase
- To help oneM2M organization improve the quality of specifications
- To ease oneM2M adoption
- To support the certification programme
- To help developers understand oneM2M in an easy manner

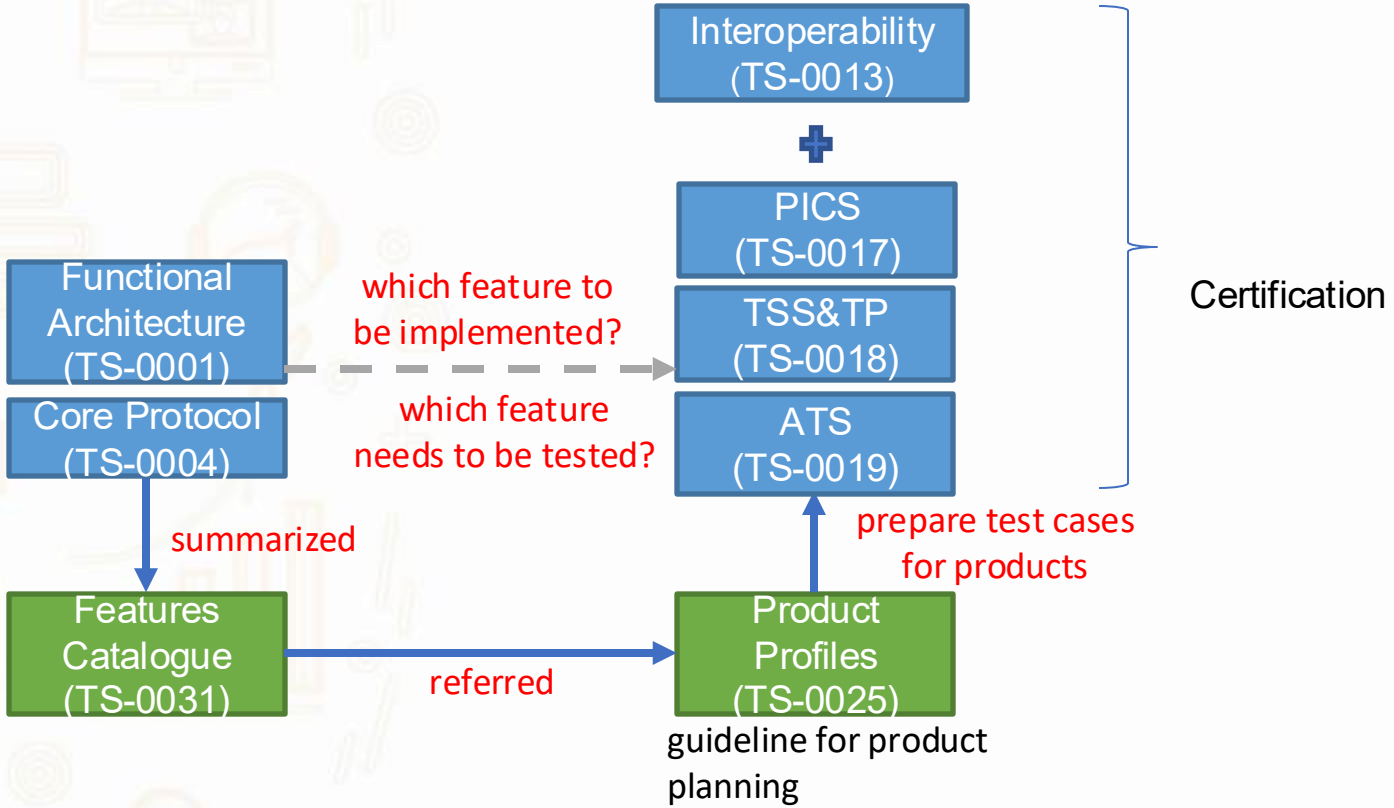
Making sure that the standards **do the right thing** and that **they do it** right

WG TDE MAIN OBJECTIVES

- Activities:
  - **Development of conformance and interoperability test specifications**
  - Development of developer guides
  - Support of test related events and developer events

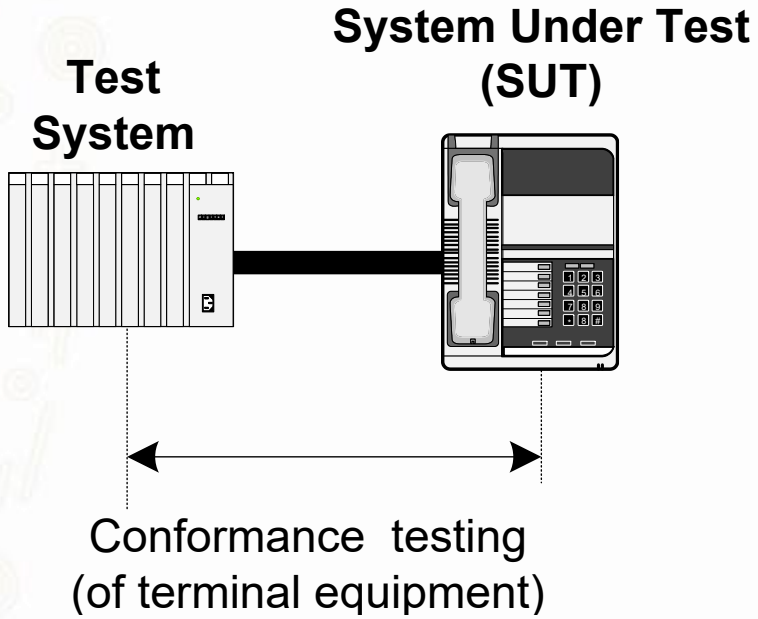
- Main specifications:
  - Methodology: **TS-0015**: Testing Framework
  - Interoperability Testing: **TS-0013**: Interop Testing
  - Conformance Testing:
    - **TS-0017**: Protocol Implementation Conformance Statement
    - **TS-0018**: Test Suite Structure & Test Purposes (TSS&TP)
    - **TS-0019**: Abstract Test Suite (ATS)
  - Definition of product profiles : **TS-0025** – Product profiles
  - Developer Guides

SPECIFICATIONS RELATIONSHIP



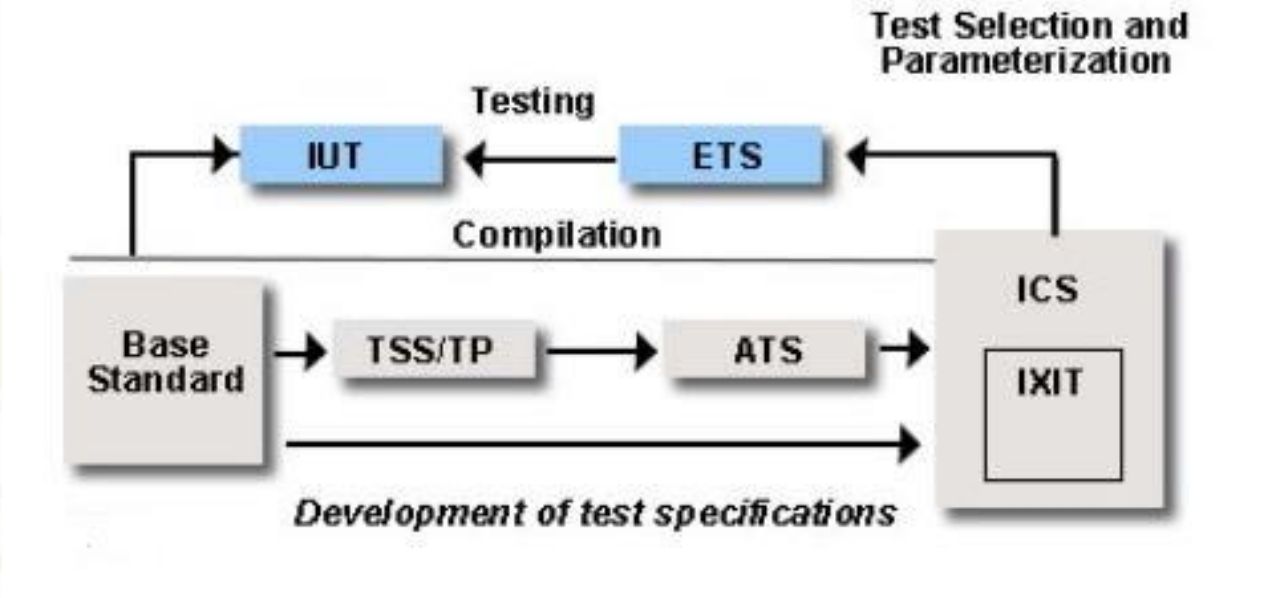
CONFORMANCE TESTING

- Conformance testing concentrates **on specific components** in a system
- Conformance testing is applied over open interfaces and checks for **conformance to the requirements** in a base specification.
- Unit testing



Development of Conformance Test Specifications

ATS : Abstract Test Suite
TSS&TP : Test Suite Structure And Test Purposes
IXIT : Implementation eXtra Information for Testing
ETS : Executable Test Suite
ICS : Implementation Conformance Statement
IUT : Implementation Under Test



Source: ISO 9646

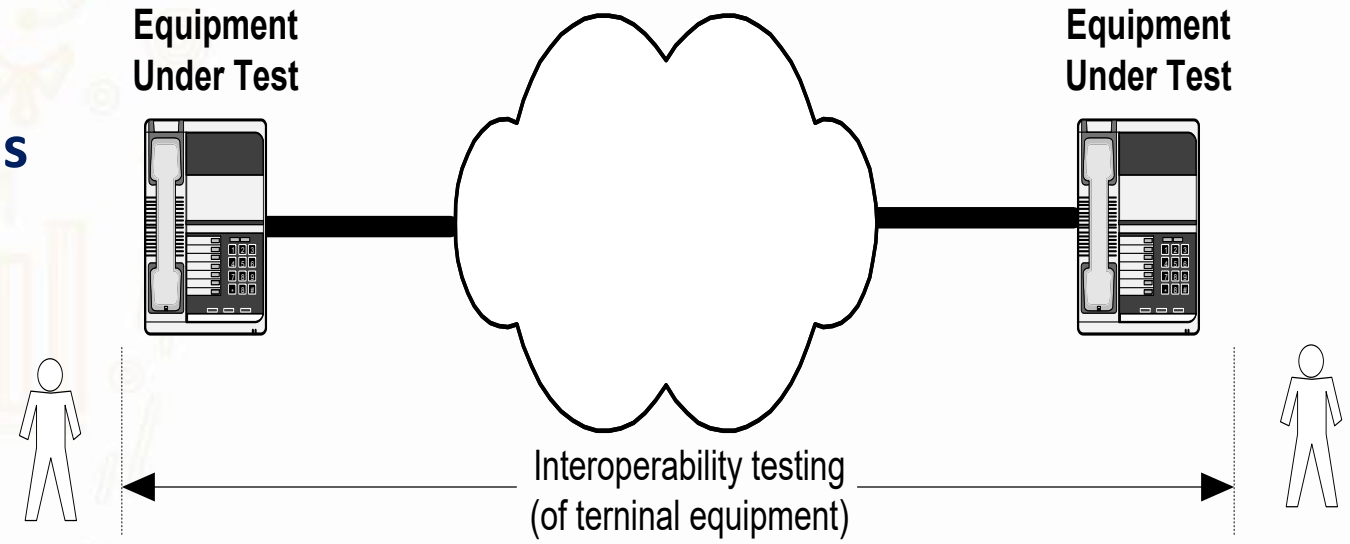
WHAT IS TTCN-3?

- Testing and Test Control Notation Version 3
- Internationally standardized language developed specifically for executable test specification
  - Specified by ETSI MTS Technical Committee
  - Is independent of a specific IUT or IUT interfaces
  - Is independent of a test execution environment
  - Standard available at portal.etsi.org via ETSI programme
- Allows unambiguous implementation of tests
- Look and feel of a regular programming language
- Good tool support (some commercial tools available)
- Successfully deployed in different organizations and industry in a variety of application domains
  - e.g., telecom, automotive, software, etc.

www.ttcn-3.org

INTEROPERABILITY TESTING

- Tests **end-to-end functionality** between 2 or more products
- It shows, from the user's viewpoint, that functionality is accomplished (**but not how**).
- System testing
- **Validation of specifications**



WHY VALIDATE SPECIFICATIONS

- To reveal problems/errors in
  - Standards and Products
- To give a higher chance of interoperable products
  - For standardisers gives assurance that they provide right functionality
  - For manufacturers and operators gives confidence to implement and go to market
- Provides an opportunity to correct errors in a controlled manner
  - Late fixes in the product cycle are more expensive than early ones
  - Decreases time to market

Specifications can be validated by several means but one of the most practical and cost effective is by

interoperability events

COMPLEMENTARITY

- Interop testing is more appropriate when the standard is in development phase . It helps to validate the standards
- Conformance testing is more appropriate for testing products. It checks that products are implemented according to the specifications
- Product could happen to be conformant but not interoperable and vice versa

INTEROPERABILITY EVENTS

- Co-organized and funded by TTA and ETSI
- Free of charge
- Open to all companies with oneM2M implementations (members and non-members)
- Covered by NDA. No companies' results are published
- Important technical feedback provided to oneM2M
- Past events
  - Sept 2015 Sophia-Antipolis (France)
  - May 2016 Seoul (South Korea)
  - Dec 2016 Kobe (Japan)
  - May 2017 Taipei (Taiwan)
  - Dec 2017 Seoul (South Korea)
  - July 2018 Washington DC (United States)
  - Nov 2020 Virtual
  - Dec 2022 Seoul (South Korea)


Sophia Antipolis (2015)


Kobe (2016)


Taipei (2017)

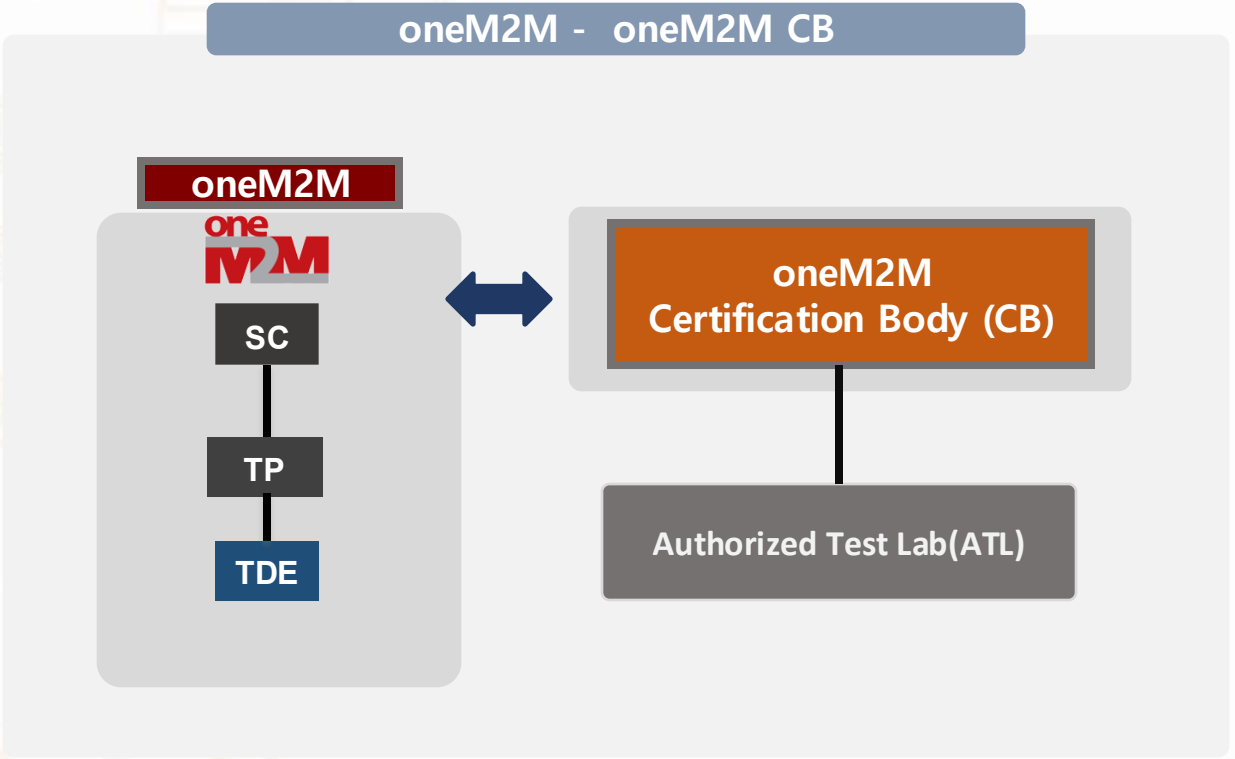

The 5th oneM2M Interop Event
4-8 Dec. 2017, Global IoT Testing & Certification Center, Pangyo, Korea
Co-hosted by ETSI and TTA
Supported by Ministry of Science and ICT
TTA

DEVELOPER EVENTS

- Introduce oneM2M to developers' communities
- Driven by numerous oneM2M partners (ETSI, TTA, KETI, C-DOT, …)
- Common developer event agenda
  - Introduction to oneM2M basics
  - Hands on exercises (using IoT kits, software,…)
- Past developer events:
    - University of Texas at Dallas
    - C-DOT campus, New Delhi
    - IIT Hyderabad
    - University of Malaga
    - International hackathons by KETI (virtual)


Partnership for M2M Standards
www.oneM2M.org
Global Partnership for M2M Standards
www.oneM2M.org

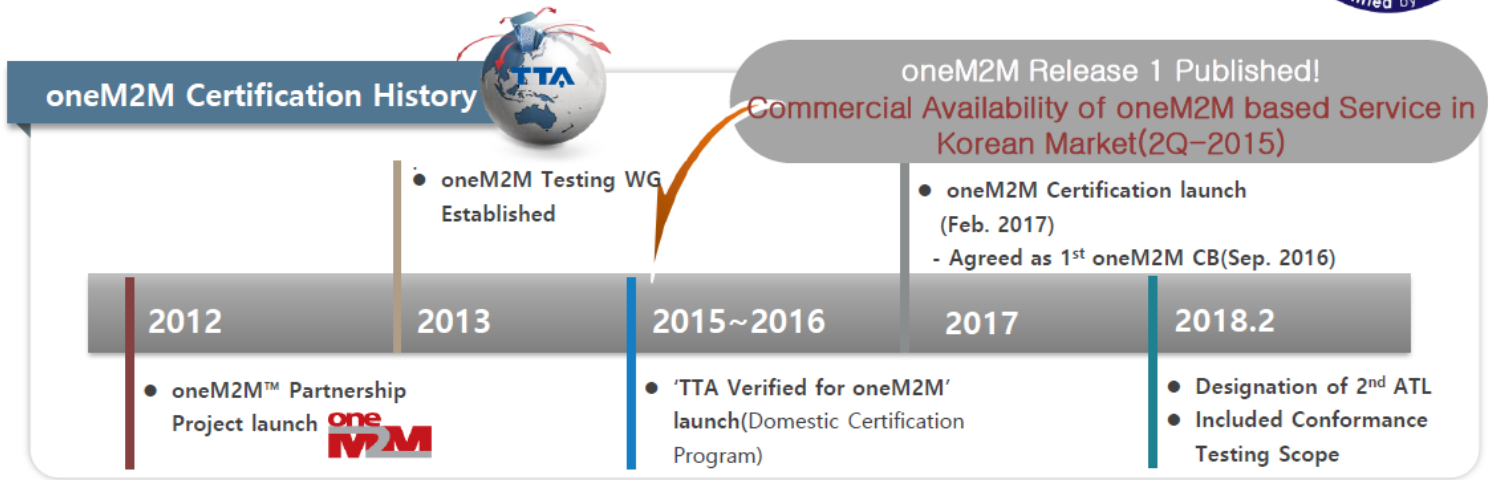
CERTIFICATION BACKGROUND



CERTIFICATION HISTORY

oneM2M Certification Background

- First oneM2M Certification Body
  - TTA was agreed as the first oneM2M Certification Body at the 33rd Steering Committee meeting(Sep. 2016).
  - TTA oneM2M Certification Program was officially launched on Feb. 9, 2017.



GLOBAL CERTIFICATION

oneM2M Certification is intended to **create an ecosystem of certified products** that **ensures interoperability** among oneM2M certified products

https://www.globalcertificationforum.org/

https://onem2m.globalcertificationforum.org/

CERTIFICATION BY GCF

- GCF took over in July 2019
- Program is open and free to both GCF members and non-members
- A product can be oneM2M certified as part of its normal GCF device certification. Alternatively, products can be oneM2M certified as a ‘standalone’ certification.

Source: GCF

CERTIFICATION PROGRAM

GCF Recognised Test Organisations (RTOs) and Assessment Capable Entities (ACEs)

	Scope	Contact	Address	Website
IOP RTO **oneM2M TS-0013**				
TTA	Rel-1 Rel-2	Hyeonyeop Shin feature77@tta.or.kr	815, Daewangpangyo-ro Sujeong-gu Seongnam-city Gyeonggi-do, 13449, Korea	https://www.tta.or.kr/tta/index.do
Conformance RTO **oneM2M TS-0018**				
TTA	Rel-1 Rel-2	Hyeonyeop Shin feature77@tta.or.kr	815, Daewangpangyo-ro Sujeong-gu Seongnam-city Gyeonggi-do, 13449, Korea	https://www.tta.or.kr/tta/index.do
SGS North America	Rel-1	Ben Kuo Ben.Kuo@sgs.com	15150 Avenue of Science Suite 3001 San Diego, CA 92128	https://www.sgsgroup.us.com
Third Party ACE **oneM2M**				
TTA	Rel-1 Rel-2	Hyeonyeop Shin feature77@tta.or.kr Keebum Kim keebum.kim@tta.or.kr	815, Daewangpangyo-ro Sujeong-gu Seongnam-city Gyeonggi-do, 13449, Korea	https://www.tta.or.kr/tta/index.do

Source: GCF

Thank You

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