ICT Standardization for Smart Future

- Standardization progress on Architectures, management, protocols & QoS
- Strengthening collaboration

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ITU-T SG20 Structure (2017-2020)

WP1/20	
Q1/20	End to end connectivity, networks, interoperability, infrastructures and Big Data aspects related to IoT and SC&C
Q2/20	Requirements, capabilities, and use cases across verticals
Q3/20	Architectures, management, protocols and Quality of Service
Q4/20	e/Smart services, applications and supporting platforms
WP2/20	
Q5/20	Research and emerging technologies, terminology and definitions
Q6/20	Security, privacy, trust and identification for IoT and SC&C
Q7/20	Evaluation and assessment of Smart Sustainable Cities and Communities
Regional groups	
SG20RG-LATAM	ITU-T SG20 Regional Group for the Latin American Region
SG20RG-EECAT	ITU-T SG20 Regional Group for Eastern Europe, Central Asia and Transcaucasia
SG20RG-ARB	ITU-T SG20 Regional Group for the Arab Region
SG20RG-AFR	ITU-T SG20 Regional Group for the Africa Region
Other groups under SG20	
JCA-IoT and SC&C	Joint Coordination Activity on Internet of Things and Smart Cities and Communities
FG-DPM	Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities

Q3/20: Architectures, management, protocols and Quality of Service

Scope

This Question addresses IoT functional architectures, protocols, management mechanisms, and QoS (including performance) of IoT and Smart Sustainable Cities and Communities (SC&C), which needed to construct architectural frameworks for the following reasons:

- to control network attachment procedures (including mobility management);
- to control session establishment and release, to control network resources (including QoS control);
- to interact with services and applications and to interact with legacy networks, etc.

Main Tasks

Developing Recommendations, Reports, Handbooks, Guidelines, etc. as appropriate on:

- Conducting studies on general reference models on IoT and vertical industry needs;
- Developing frameworks to identify the basic architectural compositions and views on IoT;
- Determining the requirements that the connectivities and protocols are intended to support;
- Identifying performance requirements of connectivity technologies that will enable them to meet the IoT requirements;
- Identifying mechanisms for achieving QoS and its measurement principles required for IoT and SC&C;
- Identifying interfaces for interoperability between different IoT network elements;
- Defining interworking with legacy systems;
- Developing intelligence control related technologies that will provide support to IoT applications and services for various verticals and systems;
- Identifying mechanisms for achieving architectural interoperability for IoT and SC&C;
- Providing the necessary collaboration for joint activities in this field within ITU and between ITU-T and SDOs, consortia and fora.

More details in: https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/Pages/q3.aspx

Q3/20 main progress

22 Approved Recommendations (2017-2020)

Work item	Question	Subject/title	Timing	Study group	Study period
Y.4115 (ex Y.IoT-DE-RA)	Q3/20	Reference architecture for IoT device capabilities exposure	2017-03	SG20	2017-2020
Y.4416 (ex Y.NGNe-IoT-arch)	Q3/20	Architecture of the Internet of things based on next generation network evolution	2018	SG20	2017-2020
Y.4417 (ex Y.IoT-son)	Q3/20	Framework of self-organization network in the IoT environments	2018	SG20	2017-2020
Y.4418 (ex Y.gw-IoT-arch)	Q3/20	Functional architecture of gateway for Internet of things applications	2018	SG20	2017-2020
Y.4455 (ex Y.IoT-NCE)	Q3/20	Reference architecture for IoT network service capability exposure	2017-09	SG20	2017-2020
Y.4500.1 (ex Y.oneM2M.ARC)	Q3/20	oneM2M- Functional Architecture	2017-09	SG20	2017-2020
Y.4500.2 (ex Y.oneM2M.REQ)	Q3/20	oneM2M- Requirements	2018-01	SG20	2017-2020
Y.4500.4 (ex Y.oneM2M.SLCP)	Q3/20	oneM2M- Service Layer Core Protocol Specification	2018-01	SG20	2017-2020
Y.4500.5 (ex Y.oneM2M.DM.OMA)	Q3/20	oneM2M- Management enablement (OMA)	2018-10	SG20	2017-2020
Y.4500.6 (ex Y.oneM2M.DM.BBF)	Q3/20	oneM2M Management enablement (BBF)	2018-01	SG20	2017-2020
Y.4500.8 (ex Y.oneM2M.PB.CoAP)	Q3/20	oneM2M- CoAP Protocol Binding	2018-01	SG20	2017-2020
Y.4500.9 (ex Y.oneM2M.PB.HTTP)	Q3/20	oneM2M- HTTP Protocol Binding	2018-01	SG20	2017-2020
Y.4500.10 (ex Y.oneM2M.PB.MQTT)	Q3/20	oneM2M- MQTT Protocol Binding	2018-01	SG20	2017-2020
Y.4500.11 (ex Y.oneM2M.CT)	Q3/20	oneM2M- Common Terminology	2018-01	SG20	2017-2020
Y.4500.12 (ex Y.oneM2M.BO)	Q3/20	oneM2M Base Ontology	2018-01	SG20	2017-2020
Y.4500.13 (ex Y.oneM2M.InteropTest)	Q3/20	oneM2M- Interoperability Testing	2018-01	SG20	2017-2020

22 Approved Recommendations (2017-2020)

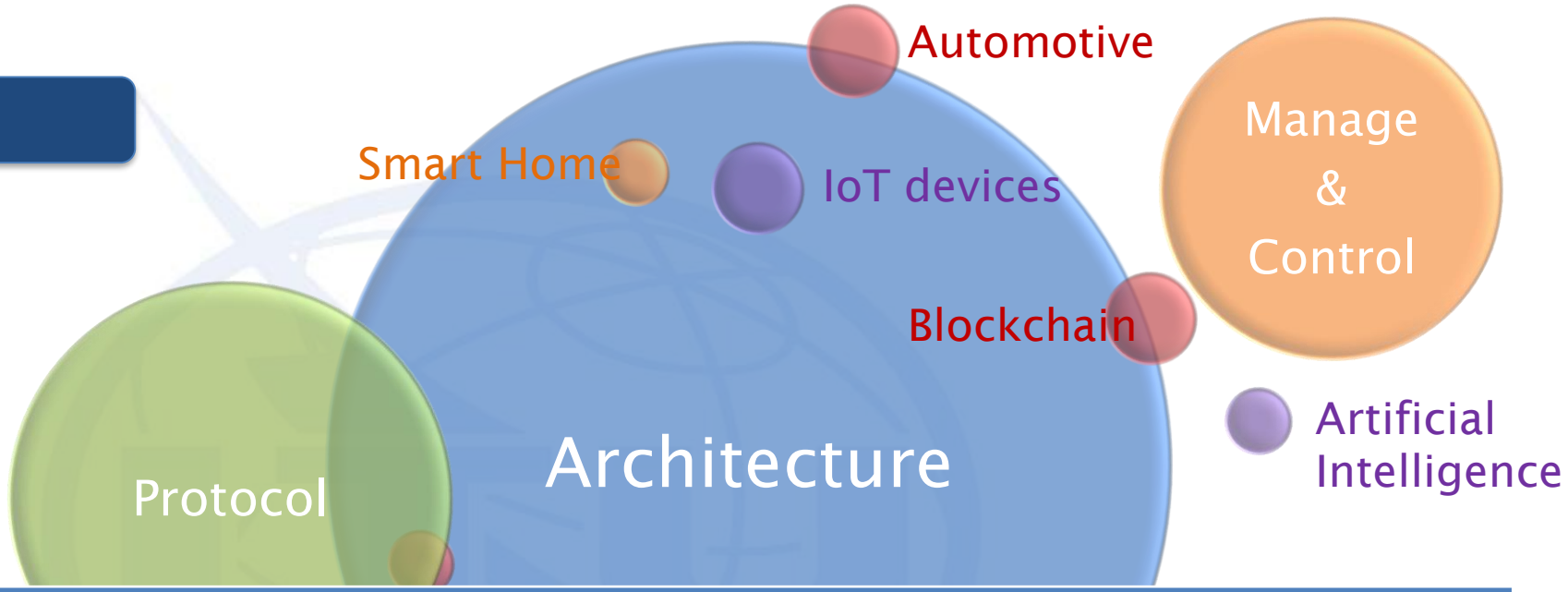
Y.4500.14 (ex Y.oneM2M.IWK.LwM2M)	Q3/20	oneM2M- LwM2M Interworking	2018-01	SG20	2017-2020
Y.4500.15 (ex Y.oneM2M.TF)	Q3/20	oneM2M- Testing framework	2018-01	SG20	2017-2020
Y.4500.20 (ex Y.oneM2M.PB.WebSocket)	Q3/20	oneM2M- WebSocket Protocol Binding	2018-01	SG20	2017-2020
Y.4500.22 (ex Y.oneM2M.FDC)	Q3/20	oneM2M- Field Device Configuration	2018-01	SG20	2017-2020
Y.4500.23 (ex Y.oneM2M.HAIM)	Q3/20	oneM2M-Home Appliances Information Model and Mapping	2018-01	SG20	2017-2020
Y.4500.32 (ex Y.oneM2M.MAF.MEF)	Q3/20	oneM2M- MAF and MEF Interface Specification			

6 Approved TRs (2017-2020)

Y.oneM2M.Ind.DE	Q3/20	oneM2M Industrial Domain Enablement	2017-09
Y.oneM2M.DG.SEM	Q3/20	oneM2M-Developer Guide of Implementing semantics	2017-09
Y.oneM2M.DG.AppDev	Q3/20	oneM2M- Application developer guide: Light control example using HTTP binding	2017-09
Y.oneM2M.DG.CoAP	Q3/20	oneM2M Developer Guide of CoAP binding and long polling for temperature monitoring	2017-09
Y.oneM2M.DG.DM	Q3/20	oneM2M- Developer guide of device management	2017-09
Y.oneM2M.UCC	Q3/20	oneM2M Use Case Collection	2017-09

Q3/20 key activities

Ongoing WIs



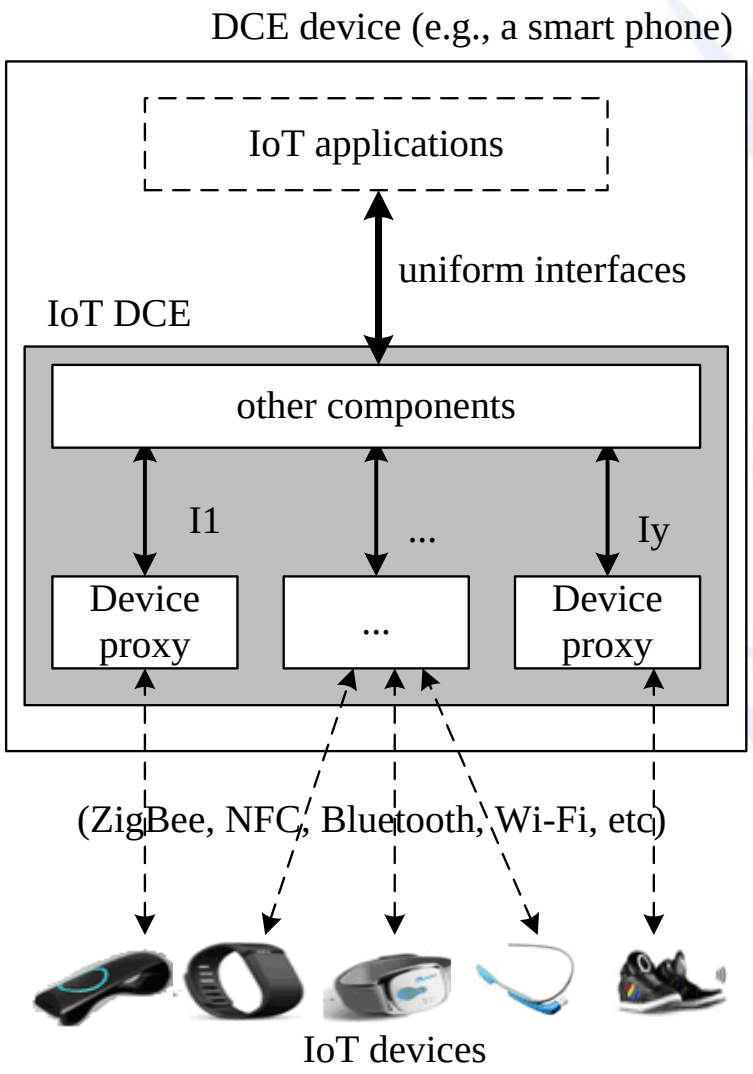
Work item	Subject / Title
Y.AERS-msd	Minimum set of data structure for automotive emergency response system
Y.AERS-mtp	Minimum set of data transfer protocol for automotive emergency response system
Y.cnce-IoT-arch	Functional architecture of cellular-radio network capability exposure for smart hospital based on Internet of things
Y.dec-IoT-arch	Decentralized IoT communication architecture based on information centric networking and blockchain
Y.IoT-ics	Requirements and functional architecture of Open IoT identity correlation service
Y.UIIS-IoT	Unified Identity/Identifier/Locator Split (UIIS) Services and Architecture in IoT Environment

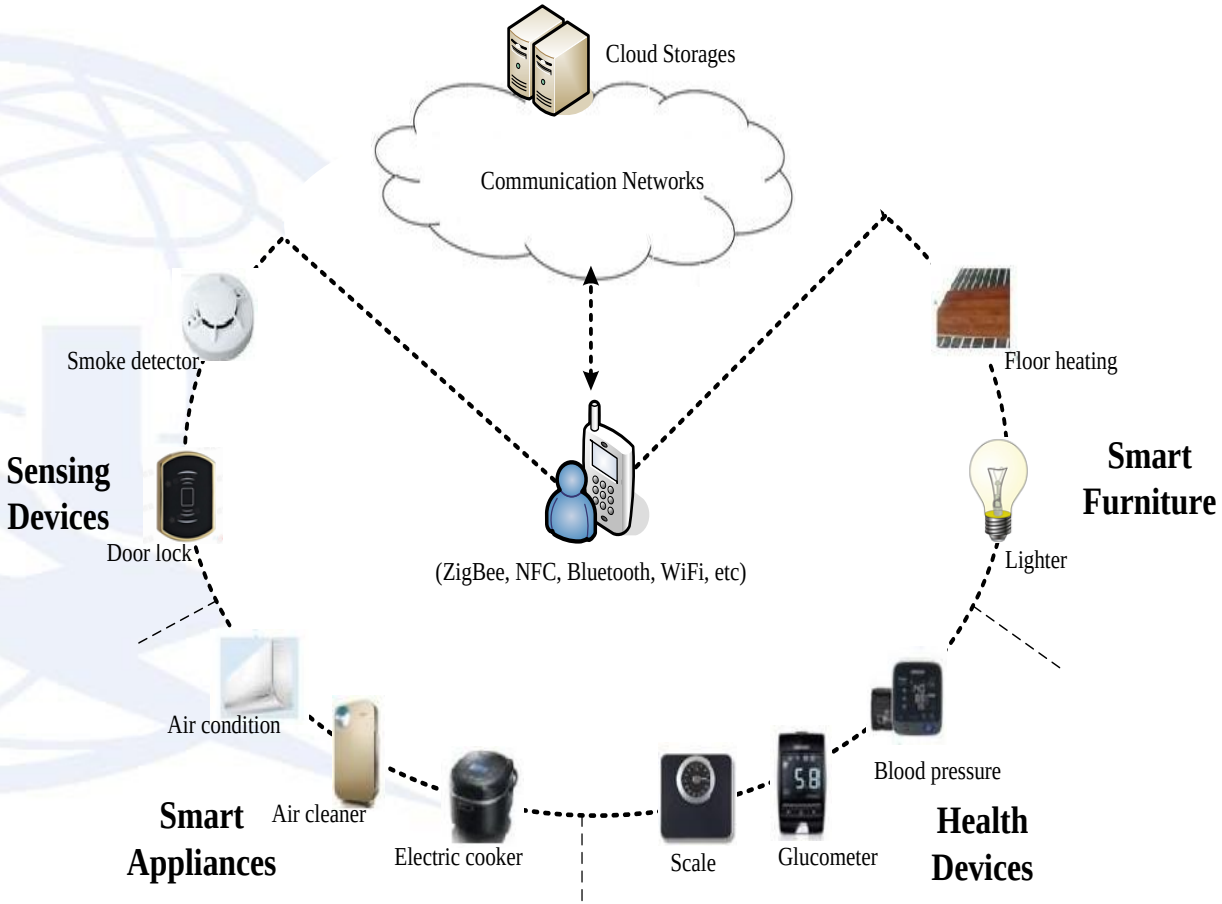
Q3/20 main activities

Ongoing WIs

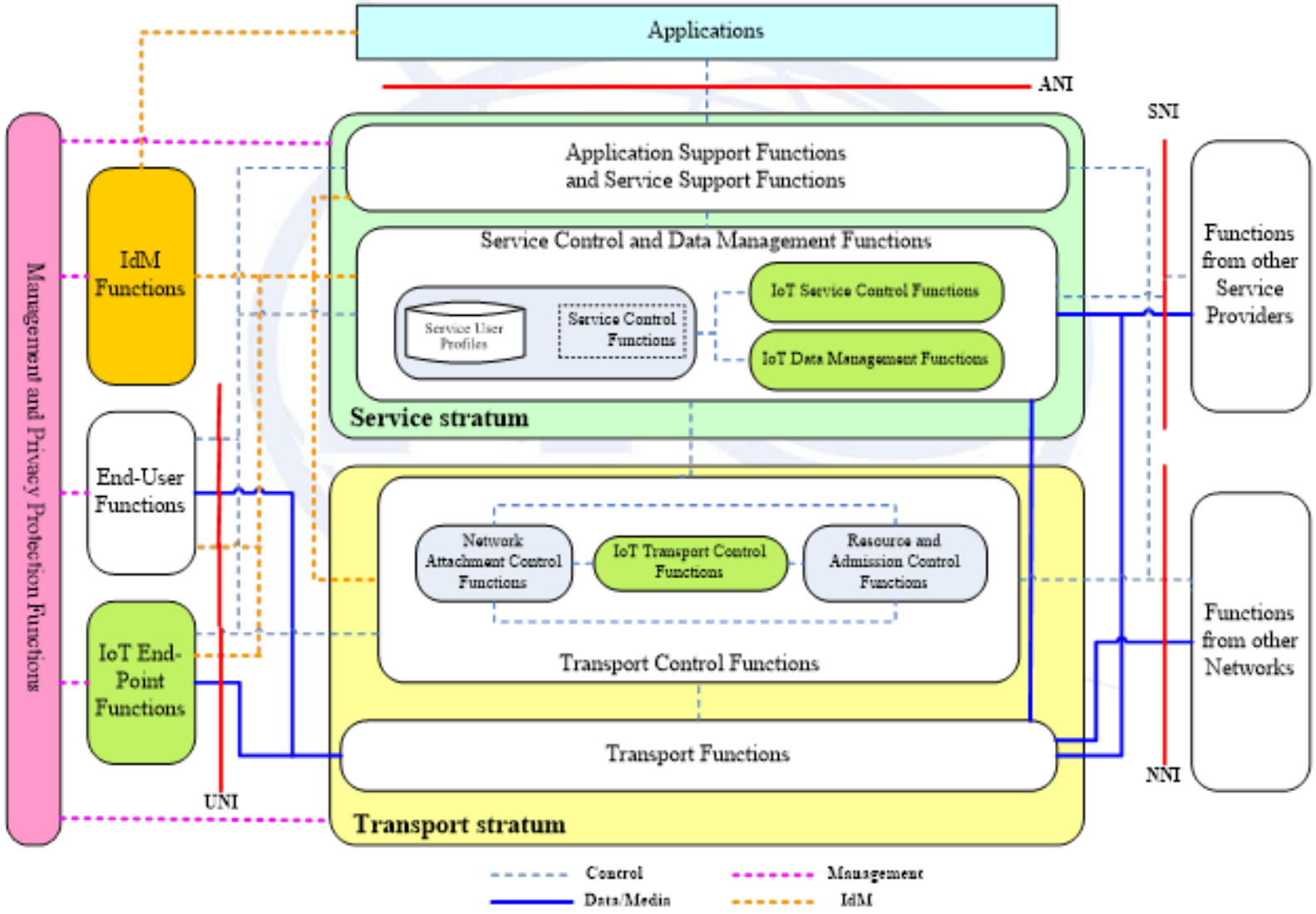
Work item	Subject / Title
Y.IoT-rf-dlt	OID-based Resolution framework for transaction of distributed ledger assigned to IoT resources
Y.IoT-rmc	Reference architecture of accessing IoT resources for management and control
Y.IoT-sd-arch	Functional architecture of Service Discovery for Interworking between Heterogeneous IoT Platforms
Y.IPv6RefModel	Reference model of IPv6 subnet addressing plan for Internet of things deployment
Y.NDA-arch	Functional architecture of network-based driving assistance for autonomous vehicles
Y.oneM2M.SEC.SOL	oneM2M- Security Solutions
Y.SCCE-arch	Reference architecture of spare computational capability exposure of IoT devices for smart home
Y.SSC-AISE-arc	Reference architecture of artificial intelligence service exposure for smart sustainable cities
Y.UAV.arch	Functional architecture for unmanned aerial vehicles and unmanned aerial vehicle controllers using IMT-2020 networks

ITU-T Recommendation Y.4115: IoT device capability exposure

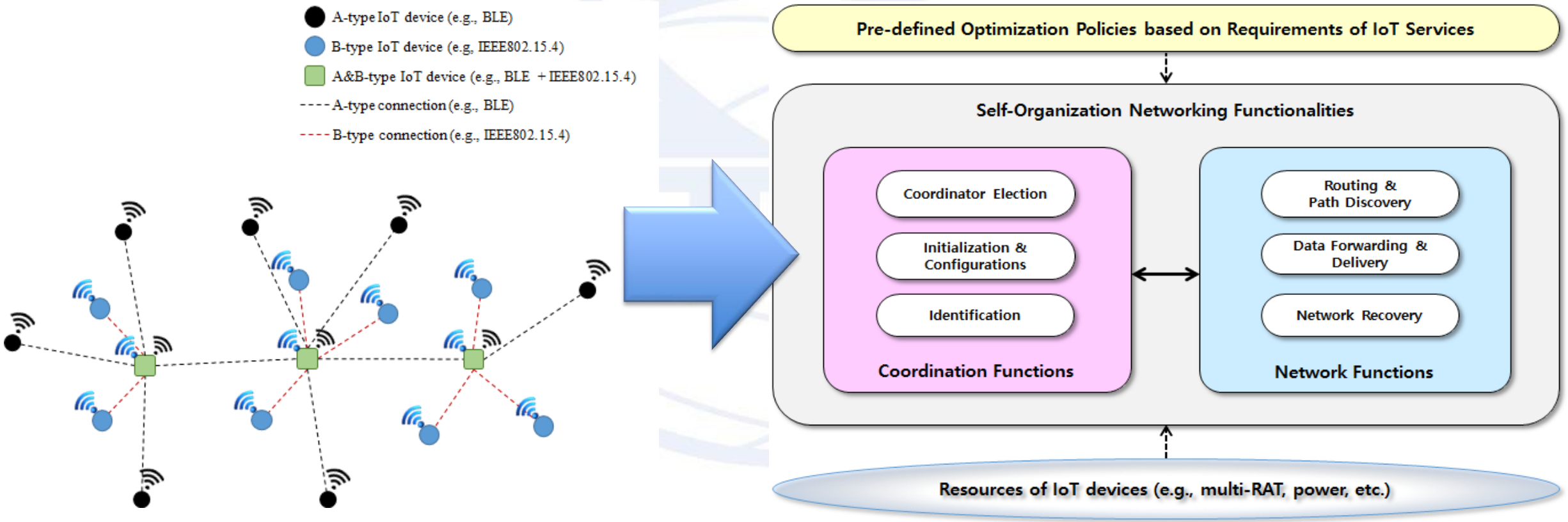




ITU-T Recommendation Y.4416：Architecture of the Internet of things based on next generation network evolution

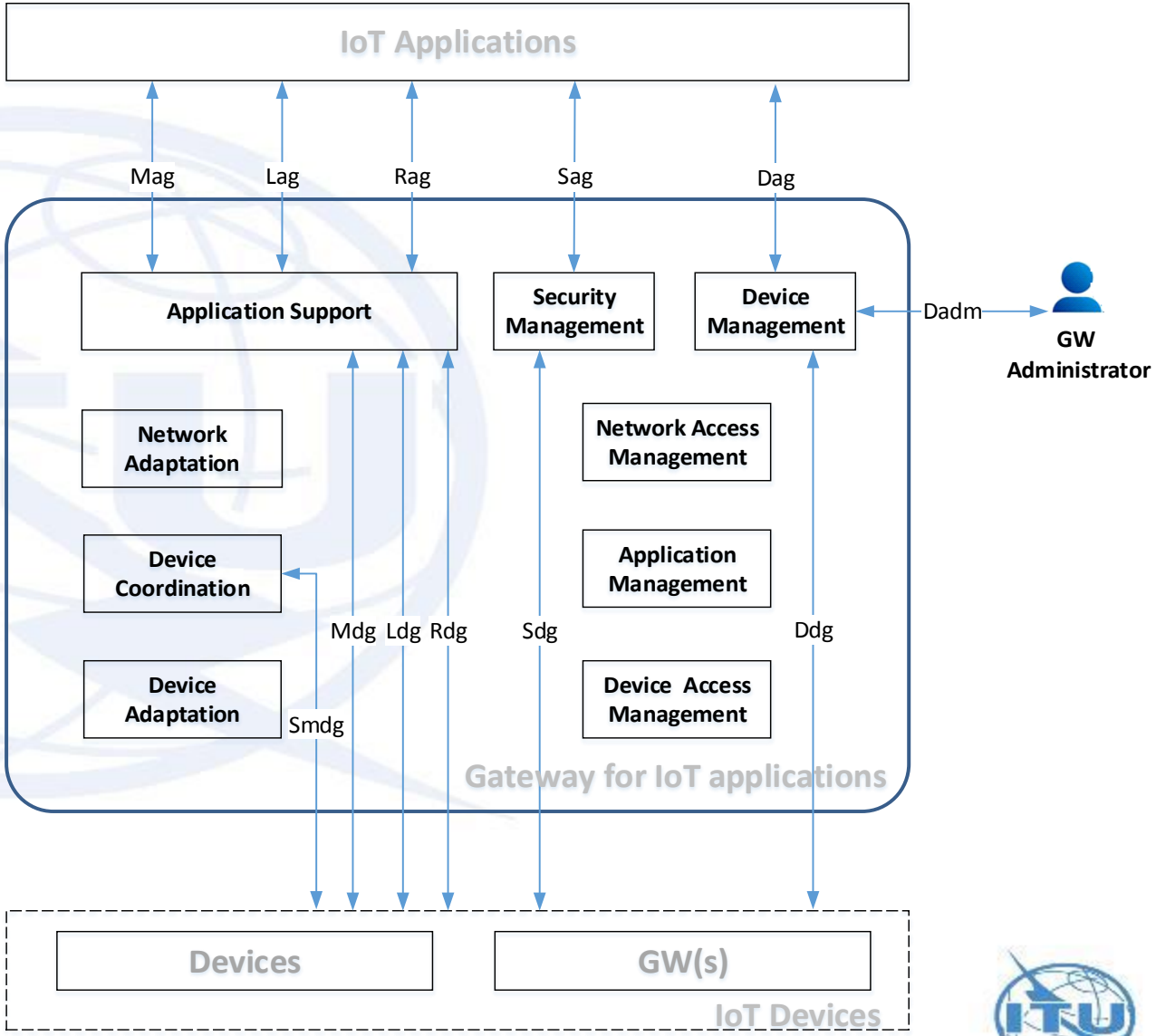


ITU-T Recommendation Y.4417: Framework of self-organization network in the IoT environments



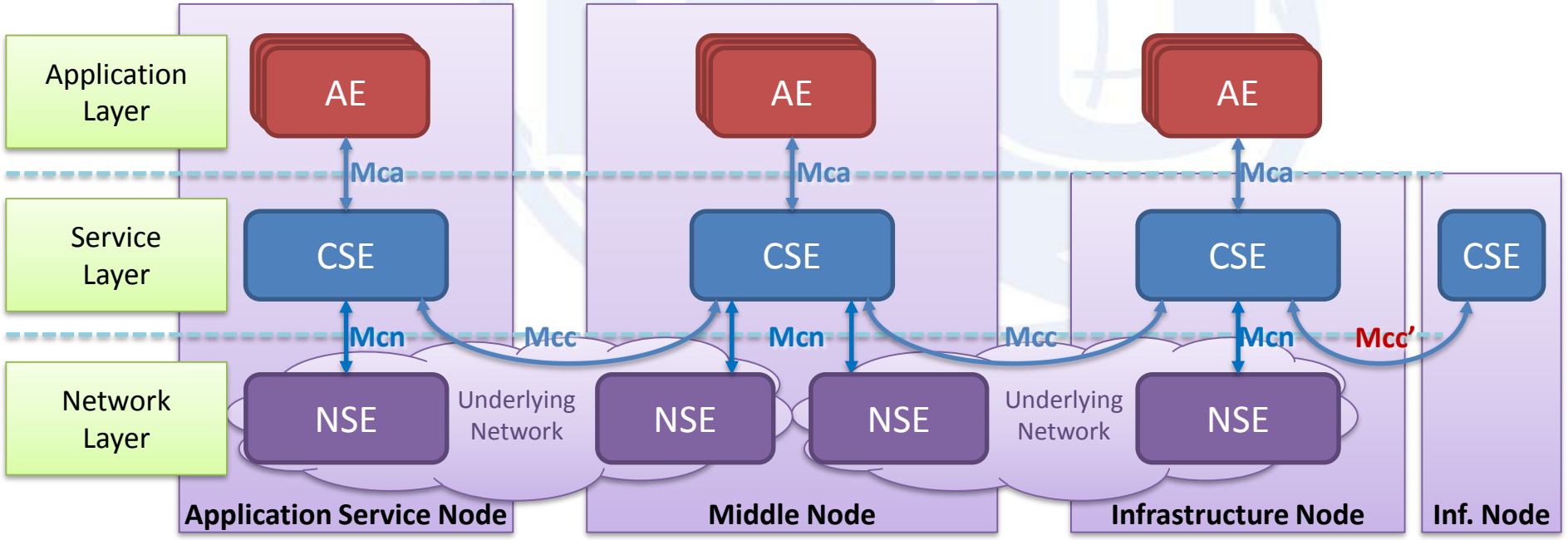
ITU-T Recommendation Y.4418: Gateway for IoT applications

- Functional architecture
- functional entities
- reference points
- Logical flows



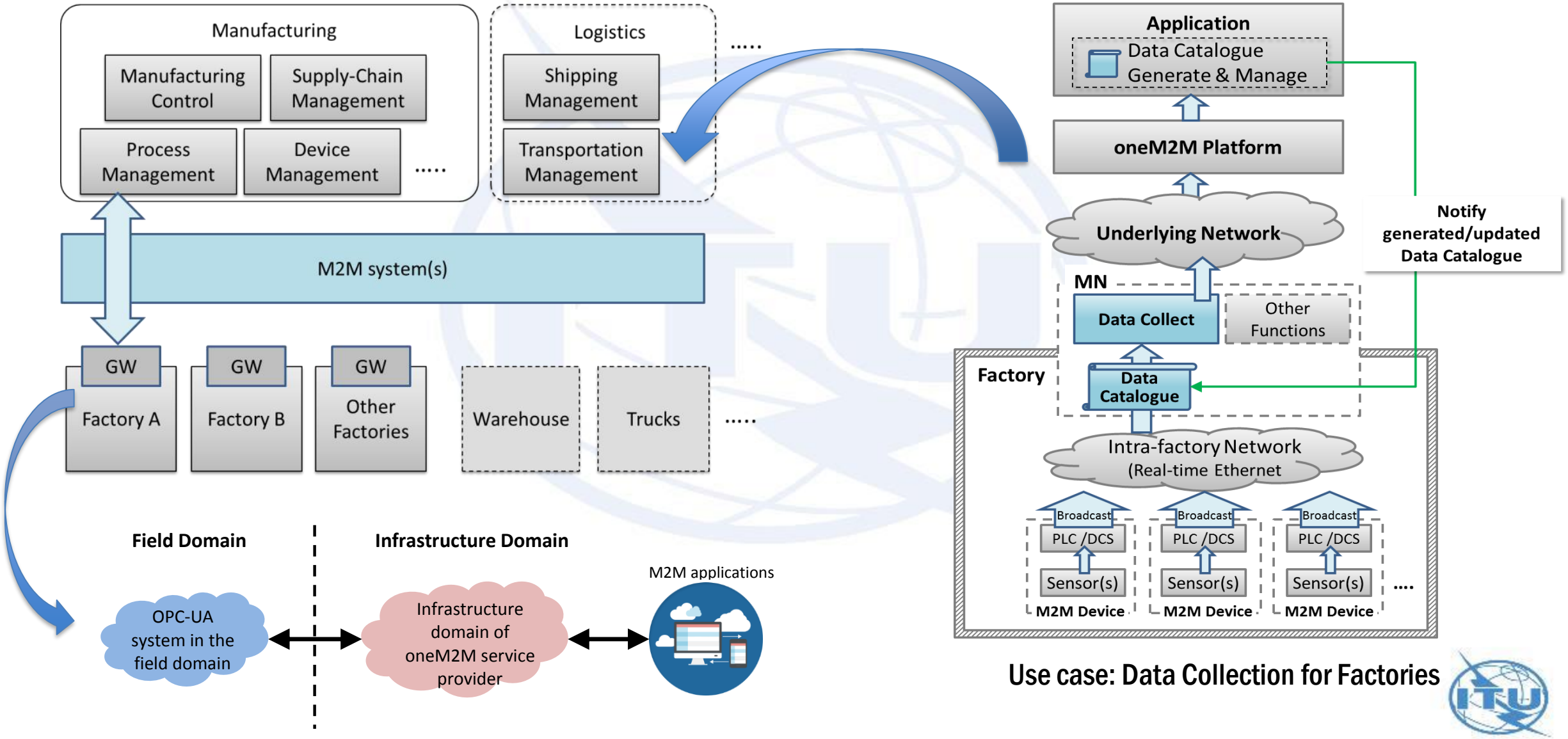
ITU-T Recommendation Y.4500.1: oneM2M Functional Architecture

Reference Point	One or more interfaces - Mca, Mcn, Mcc and Mcc' (between 2 service providers)
Common Services Entity	Provides the set of "service functions" that are common to the M2M environments
Application Entity	Provides application logic for the end-to-end M2M solutions
Network Services Entity	Provides services to the CSEs besides the pure data transport
Node	Logical equivalent of a physical (or possibly virtualized, especially on the server side) device



Multiple protocol bindings (HTTP, CoAP, MQTT, or WebSocket) over Mca, Mcc, Mcc'

Technical Report: oneM2M Industrial Domain Enablement



Use case: Data Collection for Factories

Strengthening Regional & International Collaboration

Regional Groups

- SG20RG-LATAM
- SG20RG-AFR
- SG20RG-ARB
- SG20RG-EECAT

JCA-IoT and SC&C

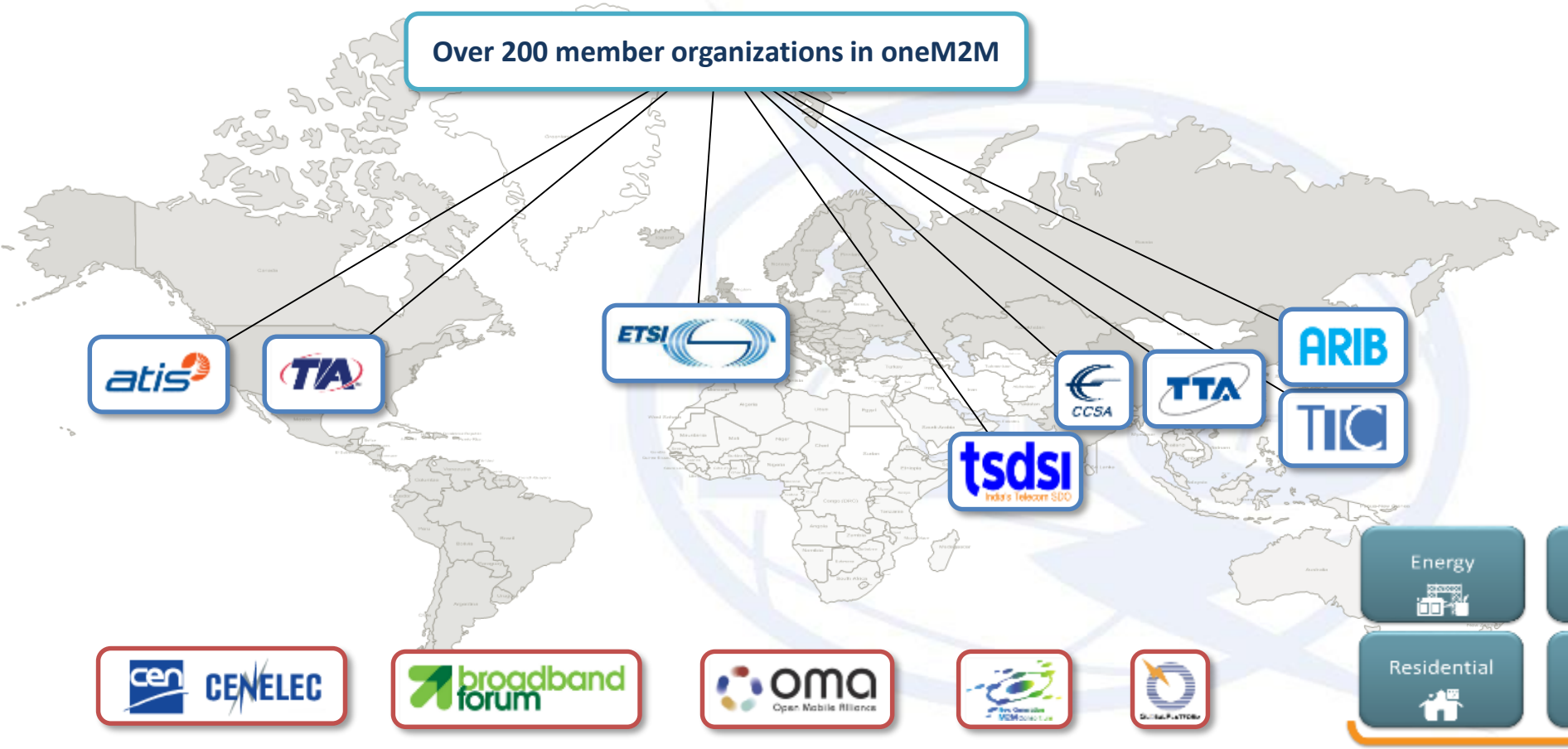
- Collaboration and coordination with other SDOs on topics on IoT and SC&C
- IoT and SC&C online standards roadmap

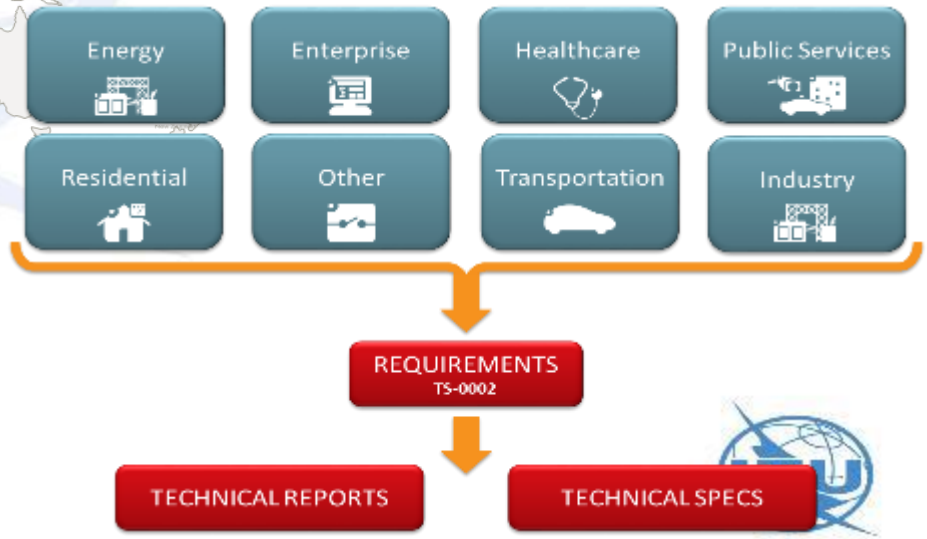
FG-DPM

SDOs

oneM2M ISO IEC

oneM2M Partnership Project



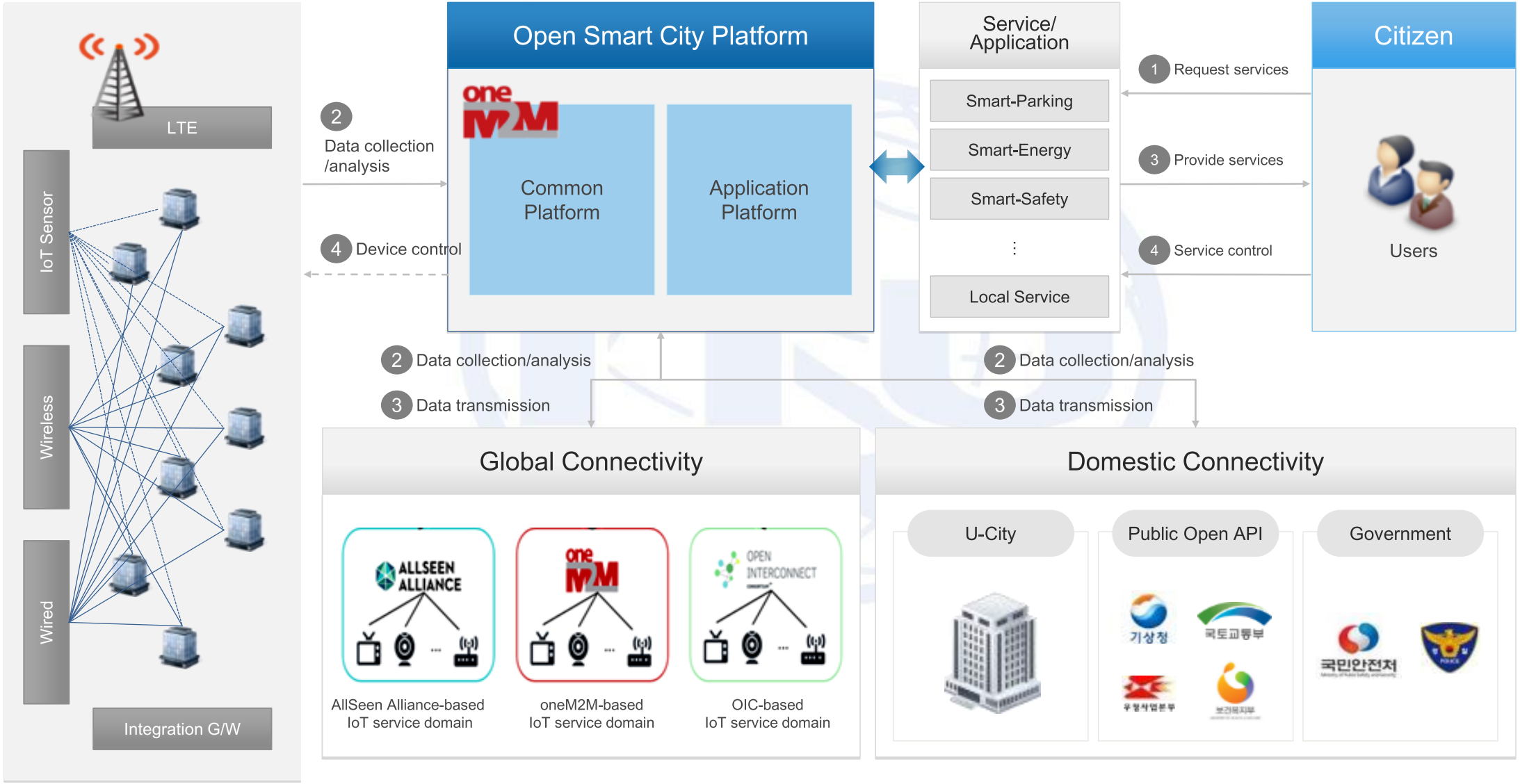


www.oneM2M.org

All document are publically available

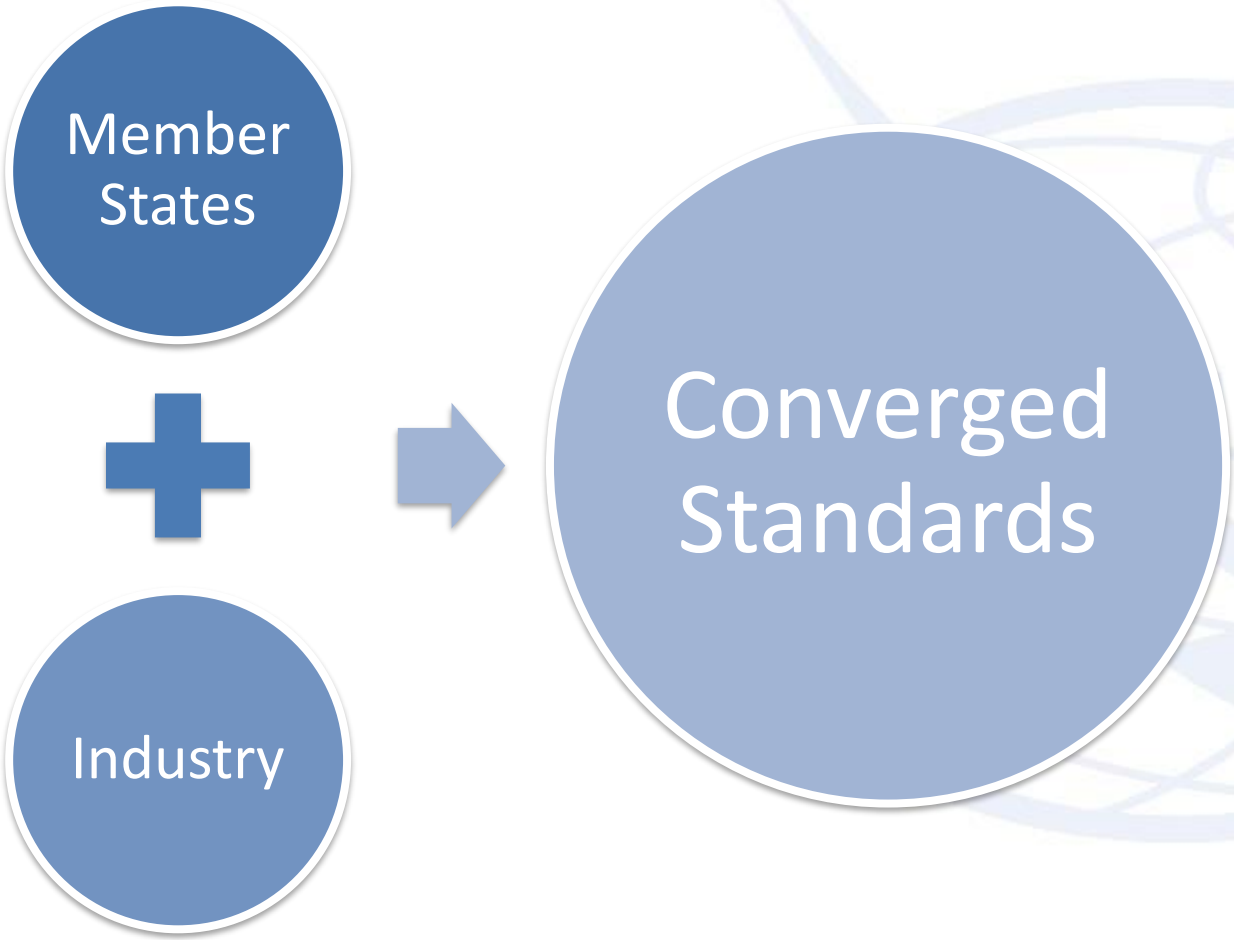
Source: oneM2M

oneM2M based smart city deployment example - Busan



Source: SKT

International Collaboration



Benefit:

- ✓ Membership of both organizations have been calling for convergence of IoT standards and alignment of work.
- ✓ The work done in both organizations is complementary.
- ✓ One of the ITU-T strategic objectives is cooperation and collaboration.
- ✓ Industry and Member States benefit from converged and aligned standards

Progress:

- ✓ 16 oneM2M Technical specifications approved as ITU-T Recommendations and 1 got AAP consent at last ITU-T SG20 meeting (Y.4500 series)
- ✓ 6 oneM2M Technical reports approved as ITU-T technical reports
- ✓ Discussion is going on for next step collaboration

Thank you

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