ITU initiatives in IoT

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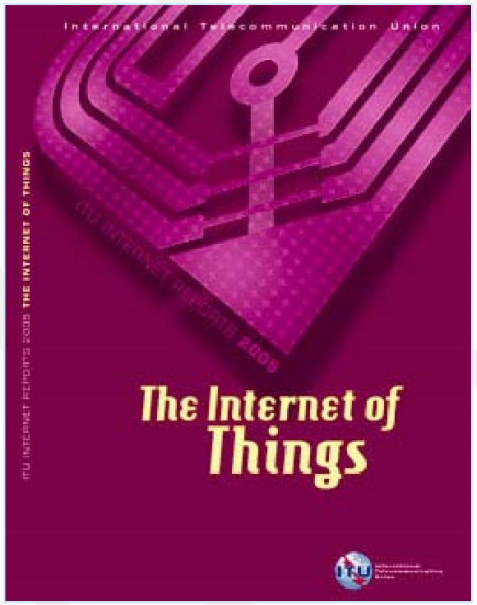
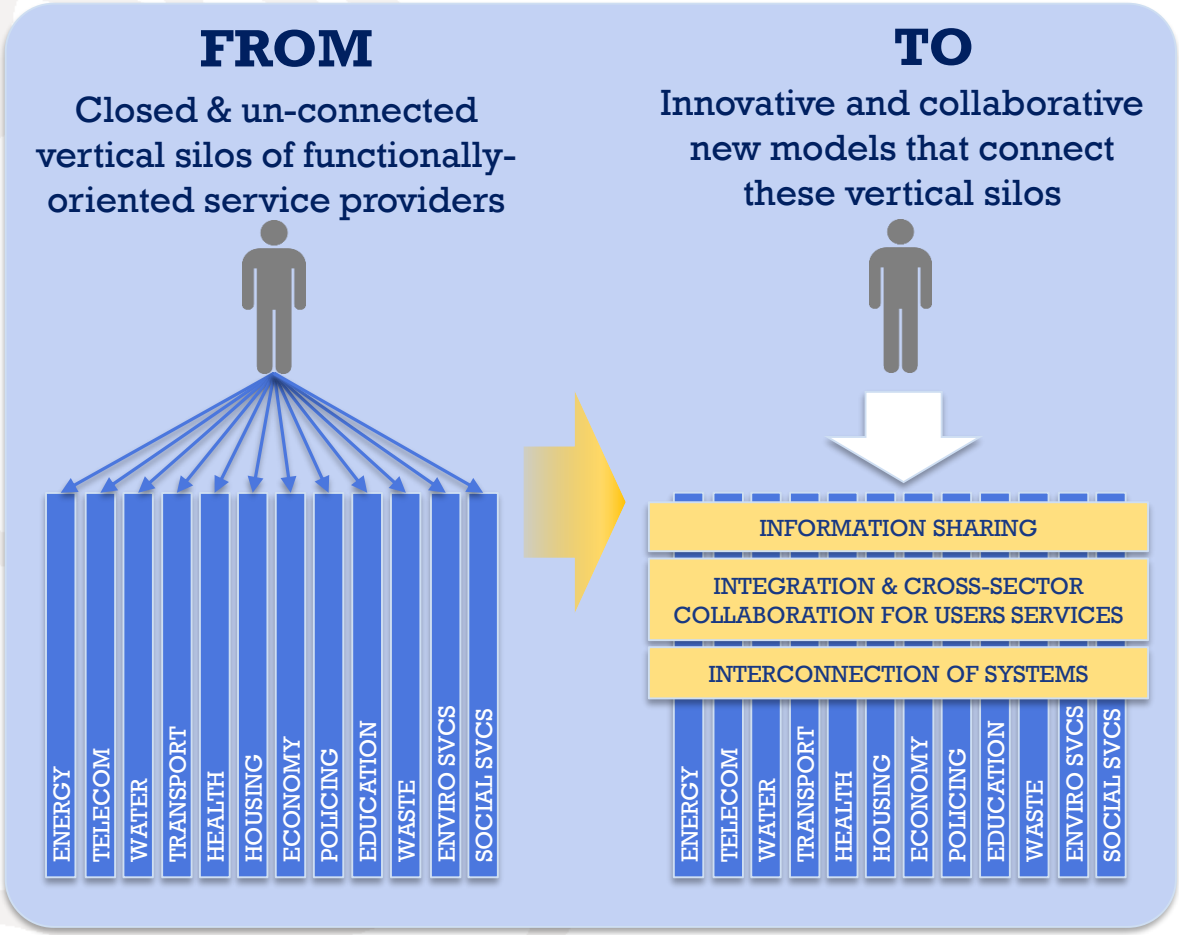
Background



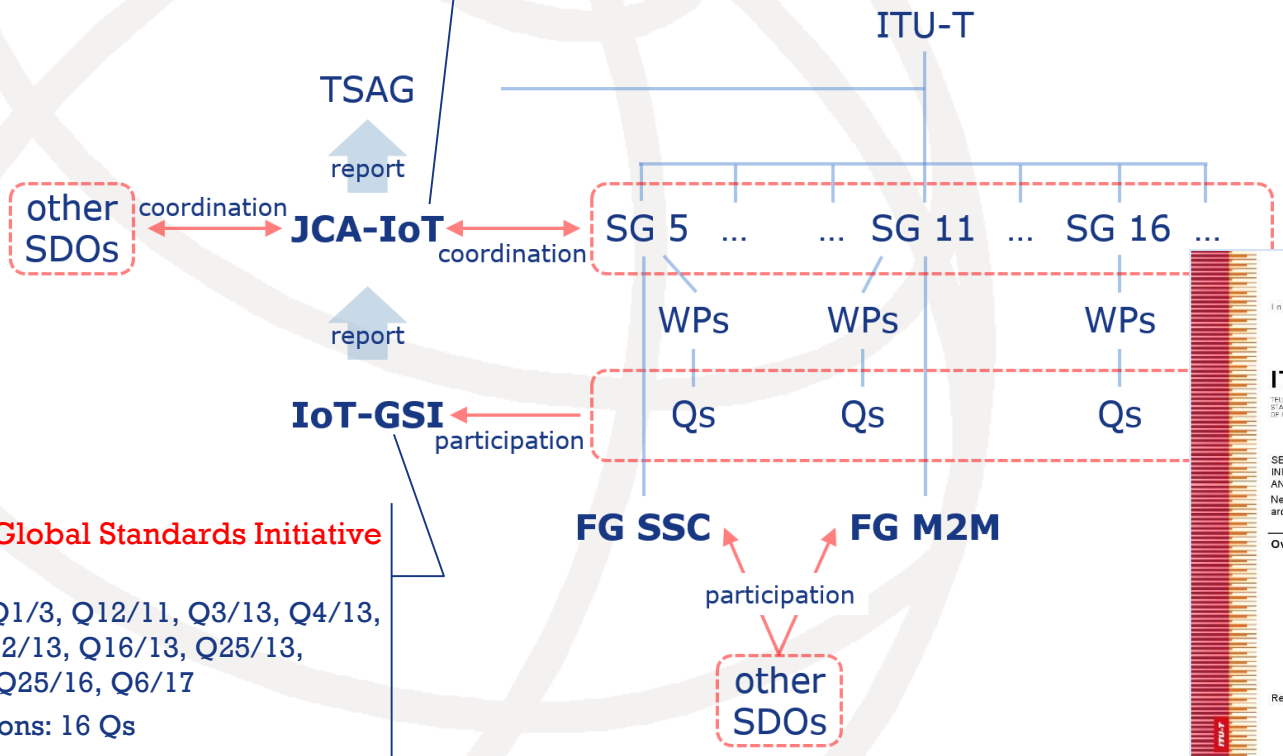
ITU report on IoT, 2005



IoT-GSI and JCA-IoT

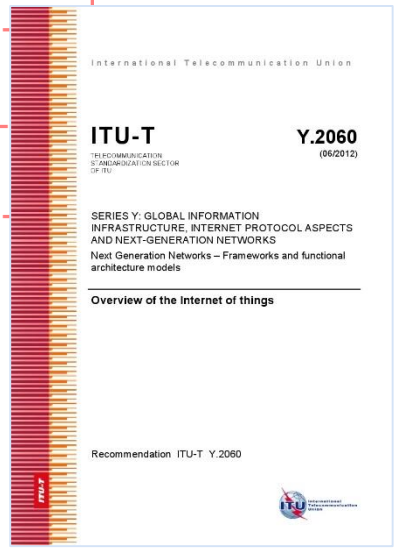
Joint Coordination Activity on Internet of Things (2011.3 ~)

- 30 participating entities: All ITU-T SGs, ITU-R WP1A, WP1B, WP5A, ISO TC 122, 204, ISO/IEC JTC 1 SC 6, 31, WG 7, ETSI, CEN, OMA, GS1/EPC global, YRP, ECMA, GSIFI, TIA, GSM MSTF, OGC
- Working deliverable: IoT Standards Roadmap



Internet of Things Global Standards Initiative (2011.5 ~)

- Core Questions: Q1/3, Q12/11, Q3/13, Q4/13, Q5/13, Q7/13, Q12/13, Q16/13, Q25/13, Q21/16, Q22/16, Q25/16, Q6/17
- Additional Questions: 16 Qs



The first ITU-T Recommendation on IoT, 2012

New Study Group on IoT in ITU-T

- ITU-T SG 20, *IoT and its applications including smart cities and communities (SC&C) (Oct. 2015)*
  - JCA-IoT changed its name to JCA-IoT and SC&C and the parent group of JCA had been transferred to the new SG20 from TSAG
  - The IoT-GSI had been discontinued

- ITU-T SG 20, *Internet of things (IoT) and smart cities and communities (SC&C) (March 2017)*

What is SG20 currently working on…

Internet of things (IoT)

- **Drones** for IoT
- IoT requirements for **edge computing**
- **Artificial Intelligence** and IoT
- Smart Manufacturing - **Industrial Internet of things**
- **Blockchain** and IoT
- IoT for **developing countries**
- **Intelligent Transport Systems** (ITS) based on IoT
- **Privacy and trust** of IoT systems
- **Interoperability**

Smart cities and communities

- Open Data in Smart Cities
- Use cases, requirements and architectures for Smart cities and communities
- Smart Services in rural communities
- Disaster notification of the population in smart cities and communities
- Smart Tourist destinations
- Smart City Infrastructure

Data management & processing

- Data structure and data transfer protocol for automotive emergency response system
- Function description and metadata of Spatio-temporal Information Service for SSC
- Integrity

Some examples of SG20 current work items…

Draft ITU-T Y.IoT-EC-GW, Capabilities and framework of edge computing-enabled gateway in the IoT

This Recommendation focuses on specific capabilities and framework of an edge computing-enabled gateway. The edge computing-enabled gateway aims to support IoT services with low latency, high reliability, and wide bandwidth characteristics.

Draft ITU-T Y.UIIS, Unified identity/ identifier/locator split (UIIS) services and architecture in IoT environment

This recommendation is intended to design a unified identify/identifier/locator split framework, with customized services for IoT networks. Specifically, with an expected introduction to the basic identity/identifier-enabled paradigm and its usage as background

ITU-T SG20 last meeting main results

Cairo, Egypt, 6-16 May 2018

216 participants

1 Recommendation Approved

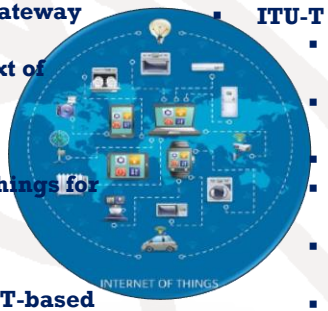
ITU-T Y.4500.2 (ex.Y.oneM2M.REQ), oneM2M- Requirements

9 Draft Recommendations Consented

14 New work items Approved

ITU-T SG20 main results since Oct 2015 (1/2)

44 New Recommendations approved



- ITU-T Y.4101, Common requirements and capabilities of a gateway for Internet of Things applications
- ITU-T Y.4003, Overview of smart manufacturing in the context of Industrial Internet of Things
- ITU-T Y.4116, Requirements of transportation safety service including use cases and service scenarios
- ITU-T Y.4117, Requirements and capabilities of Internet of Things for support of wearable devices and related services
- ITU-T Y.4118, Internet of Things requirements and technical capabilities for support of accounting and charging
- ITU-T Y.4119, Requirements and capability framework for IoT-based automotive emergency response system
- ITU-T Y.4120, Requirements of Internet of Things applications for smart retail stores
- ITU-T Y.4121, Requirements of an Internet of Things enabled network for support of applications for global processes of the earth
- ITU-T Y.4455, Reference architecture for IoT network service capability exposure
- ITU-T Y.4456, Requirements and Functional Architecture for Smart Parking Lot in Smart City
- ITU-T Y.4805, Identifier service requirements for the interoperability of Smart City applications
- ITU-T Y.4806, Security capabilities supporting safety of the Internet of Things
- ITU-T Y.4113, Requirements of the network for the Internet of Things
- ITU-T Y.4415, Architecture of web of objects based virtual home network
- ITU-T Y.4416, Architecture of the Internet of Things based on NGNe
- ITU-T Y.4417, Framework of self-organization network in the IoT environments
- ITU-T Y.4418, Functional architecture of gateway for IoT applications
- ITU-T Y.4451, Framework of constrained device networking in the IoT environments
- ITU-T Y.4452, Functional framework of Web of Objects
- ITU-T Y.4453, Adaptive software framework for IoT devices
- ITU-T Y.4553, Requirements of smartphone as sink node for IoT applications and services
- ITU-T Y.4457, Architectural framework for transportation safety services
- ITU-T Y.4702, Common requirements and capabilities
- ITU-T Y.4114, Specific requirements and capabilities of the IoT for Big Data
- ITU-T Y.4115, Reference architecture for IoT device capability exposure
- ITU-T Y.4200, Requirements for interoperability of smart city platforms
- ITU-T Y.4201, High-level requirements and reference framework of smart city platform
- ITU-T Y.4500.1, oneM2M- Functional Architecture
- ITU-T Y.4500.2, oneM2M- Requirements
- ITU-T Y.4500.4, oneM2M- Service Layer Core Protocol Specification
- ITU-T Y.4500.5, oneM2M- Management enablement (OMA)
- ITU-T Y.4500.6, oneM2M Management enablement (BBF)
- ITU-T Y.4500.8, oneM2M- CoAP Protocol Binding
- ITU-T Y.4500.9, oneM2M- HTTP Protocol Binding
- ITU-T Y.4500.10, oneM2M- MQTT Protocol Binding
- ITU-T Y.4500.11, oneM2M- Common Terminology
- ITU-T Y.4500.12, oneM2M Base Ontology
- ITU-T Y.4500.13, oneM2M- Interoperability Testing
- ITU-T Y.4500.14, oneM2M- LwM2M Interworking
- ITU-T Y.4500.15, oneM2M- Testing framework
- ITU-T Y.4500.20, oneM2M- WebSocket Protocol Binding
- ITU-T Y.4500.22, oneM2M-Field Device Configuration
- ITU-T Y.4500.23, oneM2M-Home Appliances Information Model and Mapping
- ITU-T Y.4500.32, oneM2M-MAF and MEF Interface Specification

ITU-T SG20 main results since Oct 2015 (2/2)

10 New Supplements agreed

- **ITU-T Y.Supp.45 to ITU-T Y.4000 series, An overview of smart cities and communities and the role of information and communication technologies**
- **ITU-T Y.Supp.42 to ITU-T Y.4100 series, Use cases of User-Centric work Space (UCS) Service**
- **ITU-T Y.Supp.34 to ITU-T Y.4000 series, Smart Sustainable Cities - Setting the stage for stakeholders' engagement**
- **ITU-T Y.Supp.33 to ITU-T Y.4000 series, Smart Sustainable Cities - Master plan**
- **ITU-T Y.Supp.32 to ITU-T Y.4000 series, Smart sustainable cities - a guide for city leaders**
- **ITU-T Y.Supp.31 to ITU-T Y.4550 series, Smart Sustainable Cities - Intelligent sustainable buildings**
- **ITU-T Y.Supp.28 to ITU-T Y.4550 series, Integrated management for smart sustainable cities**
- **ITU-T Y.Supp.29 to ITU-T Y.4250 series, Multi-service infrastructure for smart sustainable cities in new-development areas**
- **ITU-T Y.Supp.30 to ITU-T Y.4250 series, Overview of smart sustainable cities infrastructure**
- **ITU-T Y.Supp.27 to ITU-T Y.4400 series, Setting the framework for an ICT architecture of a smart sustainable city**

6 Technical Reports agreed

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

Some examples of SG20 achievements on IoT

ITU-T Y.4117, Requirements and capabilities of IoT for support of wearable devices and related services

This Recommendation describes characteristics, specific requirements and capabilities of the IoT for support of wearable devices and related services.

ITU-T Y.4806, Security capabilities supporting safety of the Internet of Things

This Recommendation provides a classification of the security issues for the Internet of Things and examines how the security threats may affect safety, in order to determine which security capabilities specified in Recommendation ITU-T Y.4401/Y.2068 support safe execution of the Internet of Things.

Regional & International Collaboration

- Regional groups
  - SG20 RG-LATAM
  - SG20 RG-EECAT
  - SG20 RG-ARB
  - SG20 RG-AFR
- 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
- Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities

Raising awareness on IoT and SC&C

Over 20 events organized on IoT and smart cities and communities

- **World Smart City Forum, Santa Fe, Argentina, 29 November 2018**
- **Second ITU Workshop on Data Processing and Management for IoT and Smart Cities & Communities, Tunis, Tunisia, 17 September 2018**
- **Focus Group on Data Processing and Management to support IoT and Smart Cities and Communities meeting, Tunisia, 17-20 September 2018**
- **Forum on Artificial Intelligence, Internet of things and smart cities, Wuxi, China, 3 December 2018**
- **Joint Coordination Activity on Internet of Things and Smart Cities and Communities (JCA-IoT and SC&C), Wuxi, China, 6 December 2018**
- **ITU-T Study Group 20, Wuxi, China, 3-13 December 2018**

Thank you.

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