ITU-T Study Group 20: Internet of things (IoT) and smart cities and communities (SC&C)

The Internet of Things has the power to revolutionize everything

Our Homes…

Our Businesses…

Our Cities…

ITU-T Activities on IoT & Smart Sustainable Cities

Development and implementation of standards

ITU-T Study Group 20

Research & pre-standardization work

Focus Group on **Data Processing Management (FG-DPM)**

Open platform for knowledge sharing & Forward looking research

United for Smart Sustainable Cities (U4SSC)

Resolution 98
Enhancing the standardization of IoT and Smart Cities and Communities for global development

*IoT**4**SDGs: Considers the importance of IoT to contribute to achieving the 2030 Agenda for Sustainable Development.*

ITU-T Study Group 20: Internet of things (IoT) and smart cities and communities (SC&C)

Lead study group on

Responsible for studies relating to IoT and its applications, and smart cities and communities (SC&C).

It includes studies relating to Big data aspects of IoT and SC&C, e-services and smart services for SC&C

Internet of things (IoT) and its applications

Smart Cities and Communities (SC&C), including its e-services and smart services

IoT identification

Next meeting: 3-13 December 2018, Wuxi, China

ITU-T SG20 Structure

WP1/20	Questions
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
Q7/20	Evaluation and assessment of Smart Sustainable Cities and Communities

Key issues addressed include:

- Research and emerging technologies, terminology, and definitions
- Evaluation and assessment of Smart Sustainable Cities and Communities
- Requirements, capabilities, and use cases across verticals
- Architectures, management, protocols, and Quality of Service
- e/Smart services, applications and supporting platforms
- Security, privacy, trust and identification
- End to end connectivity, networks, interoperability, infrastructures and Big Data aspects related to IoT and SC&C

ITU-T SG20 last meeting main results
Cairo, Egypt, 6-16 May 2018

Statistics:

216   Participants

1   Recommendation approved

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

9   Draft Recommendations consented

14   New work items

ITU-T SG20 Main outcomes
Cairo, Egypt, 6-16 May 2018

14 new work items

- **Y.SmartAirport** - Services and high-level requirements of smart airports for interaction with external platforms
- **Y.Sup-IoT-Eco-Plan -** Framework for Internet of Things Ecosystem Master Plan
- **Y.IoT-SLF -** Framework and capabilities for Smart Livestock Farming Based on Internet of Things
- **Y.Accessibility-PTS -** Accessibility Requirements for Smart Public Transportation Services
- **Y.IoT-EC-GW** - Capabilities and framework of edge computing-enabled gateway in the IoT
- **Y.dev-IoT-arch -** Architectural reference model of devices for IoT applications
- **Y.dec-IoT-arch -** Decentralized IoT communication architecture based on ICN and blockchain
- **Y.cnce-IoT-arch -** Functional architecture of cellular-radio network capability exposure for smart hospital based on Internet of things
- **Y.NDA-arch -** Functional architecture of network-based driving assistance for autonomous vehicles

- **Y.UAV.arch -** Functional architecture for unmanned aerial vehicles and unmanned aerial vehicle controllers using IMT-2020 networks
- **Y.SCCE-arch -** Reference architecture of spare computational capability exposure of IoT devices for smart home
- **Y.IoT-Agility -** Algorithm Agility for IT Systems and Supporting Infrastructure used in the Internet of Things
- **Y.IoT-Ath-SC -** Framework of IoT-devices authentication in Smart City
- **TR.Interact-P-D-cities -** Interaction between physical and digital cities for building Smart Sustainable City

44 New Recommendations approved (1)

- 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 fram... automotive emergency response system**"
- ITU-T Y.4120 - **Requirements of Internet of Thin... retail stores**
- ITU-T Y.4121 - **Requirements of an Internet of T... for support of applications for global processe...**
- ITU-T Y.4455 "**Reference architecture for IoT ne... exposure**"
- ITU-T Y.4456 "**Requirements and Functional Arc... Parking Lot in Smart City**"
- ITU-T Y.4805 "**Identifier service requirements fo... Smart City applications**"
- ITU-T Y.4806 " **Security capabilities supporting s... Things**"
- ITU-T Y.4113 "**Requirements of the network for...**"
- ITU-T Y.4415 - **Architecture of web of objects ba... network**
- ITU-T Y.4416 - **Architecture of the Internet of T...**
- ITU-T Y.4417 - **Framework of self-organization ... 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 ...ety services**
- ...-T Y.4702 "**Common requirements and capabilities**"
- ...-T Y.4114 "**Specific requirements and capabilities of the IoT ... Big Data**"
- ...-T Y.4115 "**Reference architecture for IoT device capability ...osure**"
- ...-T Y.4200 "**Requirements for interoperability of smart city ...tforms**"
- ...-T Y.4201 "**High-level requirements and reference ...mework of smart city platform**"
- ...-T Y.4500.1 "**oneM2M- Functional Architecture**"
- ...-T Y.4500.2 "**oneM2M- Requirements**"
- ...-T Y.4500.10 "**oneM2M- MQTT Protocol Binding**"

ITU-T SG20 main results (2)
October 2015 – July 2018

44 New Recommendations approved (2)

- 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 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 SG20 main results (3)
October 2015 – July 2018

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"**.

1 Draft new Recommendations determined

- ITU-T Y.4454 **"Platform Interoperability for Smart Cities"**

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 ongoing work items under study

- Y.Accessibility-IoT - Accessibility requirements for the Internet of things applications and services

- Y.del-fw - Framework of delegation service for the IoT devices

- Y.IoT-DA-Counterfeit - Information Management Digital Architecture to combat counterfeiting in IoT

- Y.IoT-Interop - An Interoperability framework for IoT

- Y.IoT-IoD-PT - Identity of IoT devices based on secure procedures and ensures privacy and trust of IoT systems

- Y.ODI - Open Data Indicator in smart cities

ITU-T SG20 Regional Groups

SG20 RG-EECAT - ITU-T SG20 Regional Group for Eastern Europe, Central Asia and Transcaucasia

SG20 RG-LATAM - ITU-T SG20 Regional Group for the Latin American Region

SG20 RG-ARB - ITU-T SG20 Regional Group for the Arab Region

SG20 RG-AFR - ITU-T SG20 Regional Group for the Africa Region

Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities (FG-DPM)

Key priorities:

5 Working Groups

WG1 - Use Cases, Requirements and Applications/ Services	WG2 - DPM Framework, Architectures and Core Components	WG3 - Data sharing, Interoperability and Blockchain	WG4 - Security, Privacy and Trust including Governance	WG5 - Data Economy, commercialization and monetization

To propose mechanisms, frameworks and guidelines for supporting the security, privacy and interoperability of datasets and data-management systems within the IoT and smart city domain.

Next meeting:
Bundang, Seoul, Korea (Rep.of) 14-18 January 2018

JCA – IoT and SC&C

- To co-ordinate the activity on IoT & SCC across ITU-T Study Groups and to coordinate with ITU-R and ITU-D.
- To provide a visible contact point IoT and SC&C activities in ITU-T, to seek co-operation from external bodies working in the field of IoT & SCC and enable effective two-way communication with these bodies.
- Maintenance of a list of cross-SDO IoT & SCC standardization items and associated roadmap.

- Last meeting took place on 7 September 2017

- Next meeting will be held in with SG20 meeting

Co-Conveners:
- Hyoung Jun Kim (ETRI, Korea)
- Fabio Bigi (Italy)

Secretariat:
Contact: tsbjcaiot@itu.int

D.2r16 - IoT and SC&C standards roadmap (free download) – **Send us your inputs!**

United for Smart Sustainable Cities initiative

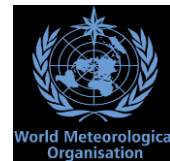**11 SUSTAINABLE CITIES AND COMMUNITIES**

U4SSC responds to **SDG 11: "Make cities and human settlements inclusive, safe, resilient and sustainable.**
U4SSC advocates for public policy to **encourage the use of ICTs** to facilitate and ease the transition to smart sustainable cities.

U4SSC is currently working on:

- Guidelines on tools and mechanisms to **finance SSC projects**
- Guidelines on strategies for **circular cities**
- **City science** application framework
- **Blockchain** 4 cities
- Guiding principles for **artificial intelligence** in cities
- **The Impact of Frontier Technologies on Cities**:
    - Artificial Intelligence and cognitive computing
    - Data processing and computation
    - Sensing technologies and IoT

Supported by:

Convention on Biological Diversity

UNITED NATIONS ECLAC

FAO FIAT PANIS

World Meteorological Organisation

United Nations Economic Commission for Africa

UNDP Empowered lives. Resilient nations.

UNECE

UNESCO United Nations Educational, Scientific and Cultural Organization

UN environment United Nations Environment Programme

UNEP FINANCE INITIATIVE

United Nations Framework Convention on Climate Change

UN@HABITAT FOR A BETTER URBAN FUTURE

UNIDO

UNITED NATIONS UNIVERSITY UNU-EGOV Operating Unit on Policy-Driven Electronic Governance
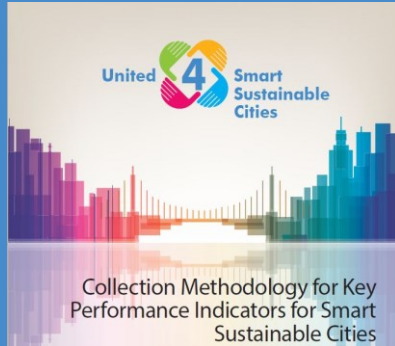
UN WOMEN

ITU

Implementing KPIs for Smart Sustainable Cities Worldwide

The U4SSC welcome all cities that would like to start their SSC journey!

The U4SSC KPIs for SSC Project – Join Now

Collection Methodology for Key Performance Indicators for Smart Sustainable Cities

The U4SSC Initiative developed a set of international **KPIs for SSC** to establish the criteria to evaluate **ICT´s contributions** in making cities smarter and more sustainable, and to provide cities with the **means for self-assessments.**

Over 50 cities worldwide are already implementing these KPIs

The Case of Dubai

The Case of Singapore

New: The Case of Moscow

54 Core Indicators + 37 advanced Indicators

3 Dimensions

Economy

Environment

Society and Culture

Coming soon: ITU Global Smart Sustainable Cities Index

KPIs structure

Measure your city's progress

54 Core Indicators + 37 advanced Indicators

20 Smart + 32 Structural + 39 Sustainable

Dimension

Economy	Environment	Society and culture

Category

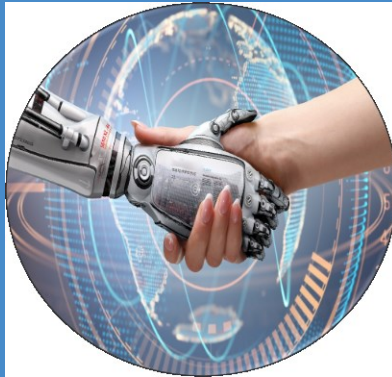| Economy	Environment	Society and culture
• ICT Infrastructure • Water and sanitation • Drainage • Electricity supply • Transport • Public sector • Employment • Innovation • Urban Planning • Buildings	• Air quality • Energy • Environmental quality • Infrastructure • Public space and nature • Waste • Water and sanitation	• Culture • Education • Health • Housing • Safety • Social inclusion • Food security

Publications on IoT and Smart Sustainable Cities

Flipbook on Unleashing the potential of the Internet of Things

This flipbook presents a compendium of the first set of ITU international standards for IoT, providing a resource of great value to standards experts interested in contributing to the work of ITU-T Study Group 20.

Flipbook on Shaping smarter and more sustainable cities: Striving for Sustainable Development Goals

This compendium of Technical Reports and Specifications details policy and technical considerations relevant to the development of SSC, providing policymakers and engineers with valuable reference material to guide their pursuit of happier, safer life in our cities.

Available on ITU website for free!

Upcoming meetings

- **World Smart City Forum**
29 November 2018, Santa Fe, Argentina
- **ITU-T Study Group 5 Regional Group for Asia and the Pacific (SG5RG-AP) meeting**
3 December 2018, Wuxi, China
- **Forum on Artificial Intelligence, Internet of Things and Smart Cities**
3 December 2018, Wuxi, China
- **ITU-T Study Group 20 "Internet of things and smart cities & communities" meeting**
3-13 December 2018, Wuxi, China
- **ITU-T Study Group 5 Regional Group for the Arab Region (SG5RG-ARB) meeting**
18 December 2018, Kuwait city, Kuwait

Thank you

ITU-T, IoT and smart cities & communities

http://itu.int/go/tsg20

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