

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Series Y

Supplement 45

(09/2017)

SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS,
NEXT-GENERATION NETWORKS, INTERNET OF
THINGS AND SMART CITIES

**ITU-T Y.4000 series – Smart sustainable cities –
An overview of smart sustainable cities and the
role of information and communication
technologies**

ITU-T Y-series Recommendations – Supplement 45

ITU-T



ITU-T Y-SERIES RECOMMENDATIONS

GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

GLOBAL INFORMATION INFRASTRUCTURE

General	Y.100–Y.199
Services, applications and middleware	Y.200–Y.299
Network aspects	Y.300–Y.399
Interfaces and protocols	Y.400–Y.499
Numbering, addressing and naming	Y.500–Y.599
Operation, administration and maintenance	Y.600–Y.699
Security	Y.700–Y.799
Performances	Y.800–Y.899

INTERNET PROTOCOL ASPECTS

General	Y.1000–Y.1099
Services and applications	Y.1100–Y.1199
Architecture, access, network capabilities and resource management	Y.1200–Y.1299
Transport	Y.1300–Y.1399
Interworking	Y.1400–Y.1499
Quality of service and network performance	Y.1500–Y.1599
Signalling	Y.1600–Y.1699
Operation, administration and maintenance	Y.1700–Y.1799
Charging	Y.1800–Y.1899
IPTV over NGN	Y.1900–Y.1999

NEXT GENERATION NETWORKS

Frameworks and functional architecture models	Y.2000–Y.2099
Quality of Service and performance	Y.2100–Y.2199
Service aspects: Service capabilities and service architecture	Y.2200–Y.2249
Service aspects: Interoperability of services and networks in NGN	Y.2250–Y.2299
Enhancements to NGN	Y.2300–Y.2399
Network management	Y.2400–Y.2499
Network control architectures and protocols	Y.2500–Y.2599
Packet-based Networks	Y.2600–Y.2699
Security	Y.2700–Y.2799
Generalized mobility	Y.2800–Y.2899
Carrier grade open environment	Y.2900–Y.2999

FUTURE NETWORKS

	Y.3000–Y.3499
	Y.3500–Y.3999

CLOUD COMPUTING

INTERNET OF THINGS AND SMART CITIES AND COMMUNITIES

General	Y.4000–Y.4049
Definitions and terminologies	Y.4050–Y.4099
Requirements and use cases	Y.4100–Y.4249
Infrastructure, connectivity and networks	Y.4250–Y.4399
Frameworks, architectures and protocols	Y.4400–Y.4549
Services, applications, computation and data processing	Y.4550–Y.4699
Management, control and performance	Y.4700–Y.4799
Identification and security	Y.4800–Y.4899
Evaluation and assessment	Y.4900–Y.4999

For further details, please refer to the list of ITU-T Recommendations.

Supplement 45 to ITU-T Y-series Recommendations

ITU-T Y.4000 series – Smart sustainable cities – An overview of smart sustainable cities and the role of information and communication technologies

Summary

Supplement 45 to the ITU-T Y-series Recommendations provides an overview of roles of information and communication technologies (ICTs) in smart sustainable cities (SSCs) primarily based on ITU-T Recommendations. An SSC aims to improve quality of life (QoL), efficiency of urban operation and services, as well as competitiveness, ensuring that the needs of present and future generations with respect to economic, social, environmental and cultural aspects of cities and communities are met.

SSCs in general, share the goal of achieving an economically sustainable urban environment without compromising the QoL of their citizenry. A smart city and community strives to create a sustainable living environment for citizens using the Internet of things (IoT), enabled by ICTs.

An IoT-based infrastructure, enabled using ICTs, can continue to play a pivotal role in SSCs by functioning as a platform for the aggregation of information and data that can help government officials and citizens understand how the city is functioning in terms of resource consumption and services.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T Y Suppl. 45	2017-09-15	20	11.1002/1000/13394

Keywords

Cities, information and communication technologies (ICTs), Internet of things (IoT), smart sustainable city (SSC), sustainability.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this publication, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this publication is voluntary. However, the publication may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the publication is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the publication is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this publication may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the publication development process.

As of the date of approval of this publication, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this publication. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2017

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

		Page
1	Scope.....	1
2	References.....	1
3	Definitions	1
	3.1 Terms defined elsewhere	1
	3.2 Terms defined in this Supplement	2
4	Abbreviations and acronyms	2
5	Conventions	2
6	Smart sustainable cities: goal and city dimensions.....	2
	6.1 Goal of smart sustainable cities	2
	6.2 Smart sustainable cities landscape.....	3
7	Use of information and communication technologies in smart sustainable cities.....	5
	7.1 Integrated approach to smart sustainable cities	5
	7.2 Use of information and communication technologies in city infrastructure ..	6
	7.3 Information and communications technology services and applications in smart sustainable cities	7
	7.4 Data and confidentiality, integrity and availability in smart sustainable cities.....	7
	7.5 Internet of things in smart sustainable cities	8
8	Sustainability impacts of information and communications technology on smart sustainable cities	8
	8.1 Contribution of information and communications technology to environmental sustainability.....	9
	8.2 Contribution of information and communications technology to economic sustainability.....	10
	8.3 Contribution of information and communications technology to societal sustainability.....	10
	8.4 Contribution of information and communications technology to governance sustainability	11
9	Evaluation of smart city initiatives and achievements of smart sustainable cities	11
	Bibliography.....	12

Copyright International Telecommunication Union/ITU Telecommunication Sector
Provided by IHS Markit under license with ITU-T
No reproduction or networking permitted without license from IHS