

ITU/ALECSO High Level Meeting on Cloud Computing for Education
Tunis-Tunisia, 30-31 October 2018

ITU Cloud Computing Activities & Outcomes



Presented by: Mr. Slaheddine MAAREF

Senior Advisor and Deputy Regional Director

ITU Regional Office for the Arab States

slaheddine.maaref@itu.int



An introduction to the

ITU WORLD

*Getting to know the United Nations specialized
agency for information and communication
technologies*

Our Members



193

**MEMBER
STATES**



+800

**PRIVATE SECTOR
ORGANIZATIONS**



120

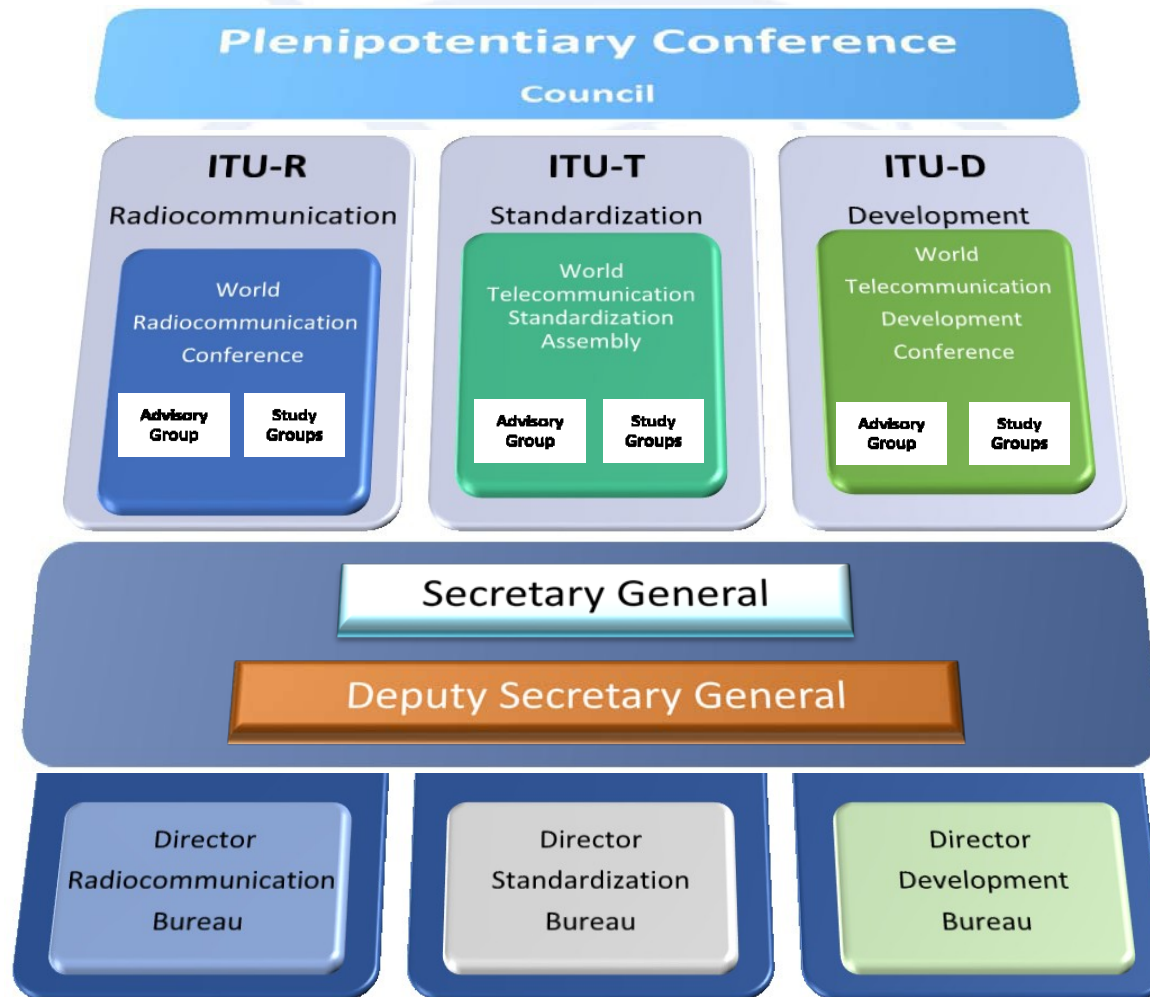
ACADEMIA

Our Structure

Regional Offices



Our Governance



Meet the Sectors

Three ITU Sectors



'Committed to
Connecting the World'



ITU Radiocommunication
Coordinating radio-frequency
spectrum and **assigning** orbital
slots for satellites

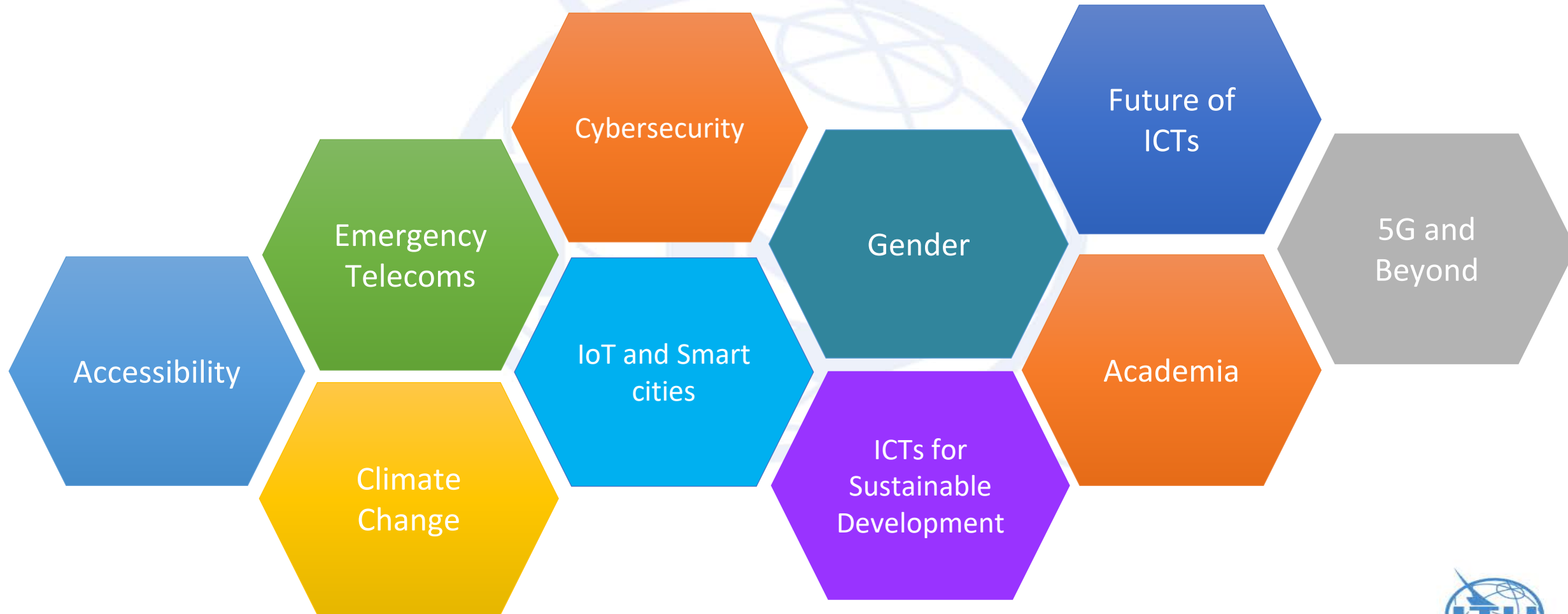


ITU Standardization
Establishing international standards



ITU Development
Bridging the digital divide

Our Areas of Action





ITU Cloud Computing Activities & Outcomes

ITU Cloud Computing activities and outcomes

Cloud Computing:

Paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand

Definition per ITU recommendation Y.3500



ITU-D Activities on Cloud Computing

Report of ITU-D SG1 Question 3/1: Access to cloud computing: challenges and opportunities for developing countries *(released in 2017)*



Outline

- ❑ **Introduction to Cloud Computing**
 - Definitions, Characteristics
 - Future trends
 - What, Why, How
- ❑ **State of the business of cloud computing in developing countries**
- ❑ **Opportunities and challenges for businesses, consumers and governments to adopt cloud**
- ❑ **4 Pillars towards cloud adoption:** Innovation, infrastructure, skills and awareness, trust
 - ❖ **Innovation**
 - Local content
 - Local services

Download link: https://www.itu.int/dms_pub/itu-d/opb/stg/D-STG-SG01.03.1-2017-PDF-E.pdf



ITU-D Activities on Cloud Computing

Report of ITU-D SG1 Question 3/1: Access to cloud computing: challenges and opportunities for developing countries *(released in 2017)*



Outline (Cont.)

❖ Infrastructure

- Infrastructure needs for supporting and enabling access to cloud services
- Features of networks that support effective access to cloud-computing services
- Energy
- Broadband
- Spectrum
- IXPs
- Best practices for developing such infrastructure
- Cost models and implications for developing local cloud infrastructures

❖ Skills and awareness

- Policy makers
- Leaders
- Innovators



ITU-D Activities on Cloud Computing

Report of ITU-D SG1 Question 3/1: Access to cloud computing: challenges and opportunities for developing countries *(released in 2017)*



Outline (Cont.)

❖ Trust

- Policy and Regulatory tools that enable effective access to cloud-computing services;
- Transparency
- Security
- Data Privacy
- Standards

❑ Case studies and lessons learned

- Australia, Bhutan (Kingdom of), Burkina Faso, China (People's Republic of), India, Korea (Republic of), Singapore, United Kingdom, United States of America

❑ Conclusions and recommendations

- Future work



ITU-D Activities on Cloud Computing

New Report on : Usage and Provision Of Cloud Computing Services in Arab Countries

(Ongoing, Release in December 2018 (TBC))



- ❑ **Objective:** Improve the use and implementation of Cloud Computing Technology in Arab countries through:
 - assessing the situation of using and providing Cloud Computing in Arab Countries
 - identifying the main opportunities, barriers, issues and needs
 - proposing a set of relevant guidelines allowing all related stakeholders to benefit from the use of cloud computing technology at different levels

ITU-D Activities on Cloud Computing

New Report on : Usage and Provision Of Cloud Computing Services in Arab Countries

(Ongoing, Release in December 2018 (TBC))



- ❑ A survey on the “Usage and Provision Of Cloud Computing Services in Arab Countries” was disseminated in **June 2018**, and was sent to the 22 Arab countries
- ❑ The objective of this survey is **to collect information and experiences on the consumption and the provision of cloud computing services in Arab Countries** which will be used to elaborate the report on this topic
- ❑ **44** responses were received from **11** Arab Countries
- ❑ Responses came from **different stakeholders** (Ministries, regulators, operators, academia, banks, ...)

ITU-D Activities on Cloud Computing

Questionnaire on : Usage and Provision Of Cloud Computing Services in Arab Countries



Topics	Nb. of Questions	Overview
General Questions	12	Line of Business, internet connection type, number of CSPs and Data Centers in the country, most sectors using the Cloud in the country, social and economic advantages of Cloud Computing, ...
Use of Cloud Computing Services	15	Motivations for use, deployment model,s cloud offerings and applications, costs, criteria for the choice of CSPs, advantages, internal and external barriers, ...
Provision of Cloud Computing Services	11	Motivations for provision, deployment models, provided cloud services, infrastructure requirements, challenges, ...
Towards an improved use and provision of Cloud Computing services	13	National initiatives, data protection and security, Capacity Building and Support, standardization requirements, data centers improvements, Experiences and success stories, ...

ITU-T Activities on Cloud Computing

- ❑ Within ITU-T, Study Group 13 on “***Future networks, with focus on IMT-2020, cloud computing and trusted network infrastructures***” is the lead Study Group on Cloud Computing
- ❑ The work on Cloud Computing under SG13 started in **February 2012** after the conclusion of ITU-T FG Cloud
- ❑ During this study period (2017-2020), Cloud Computing is studied by 3 questions under **WP 2/13 : Cloud Computing & Big Data**

Q17/13: Requirements, ecosystem, & general capabilities for cloud computing & big data

Q18/13: Functional architecture for cloud computing and big data

Q19/13: End-to-end cloud computing management, cloud security and big data governance

ITU-T Activities on Cloud Computing



18 Approved Recommendations (At SG13 level)

- ❑ [Y.3500](#): Cloud computing - Overview and Vocabulary (2014-08)
- ❑ [Y.3501](#): Cloud computing framework and high-level requirements (2016-06)
- ❑ [Y.3503](#): Requirements for desktop as a service (2014-05)
- ❑ [Y.3504](#): Functional Architecture for Desktop as a Service (2016-06)
- ❑ [Y.3505](#): Cloud computing - Overview and functional requirements for data storage federation (2018-05)
- ❑ [Y.3506](#): Cloud computing - Functional requirements for cloud service brokerage (2018-05)
- ❑ [Y.3600](#): Big data – cloud computing based requirements and capabilities (2016-07)
- ❑ [Y.3502](#): Cloud computing - reference architecture (2014-08)
- ❑ [Y.3510](#): Cloud computing infrastructure requirements (2016-02)
- ❑ [Y.3511](#): Framework of inter-cloud computing (2014-03)
- ❑ [Y.3512](#): Cloud computing - Functional requirements of Network as a Service (2014-08)
- ❑ [Y.3513](#): Cloud computing - Functional requirements of Infrastructure as a Service (2014-08)
- ❑ [Y.3515](#): Cloud computing - Functional architecture of Network as a Service (2017-07)
- ❑ [Y.3516](#): Cloud computing - Functional architecture of inter-cloud computing (2017-09)
- ❑ [Y.3514](#): Cloud computing - Trusted inter-cloud computing framework and requirements (2017-05)
- ❑ [Y.3520](#): Cloud computing framework for end to end resource management (2015-09)
- ❑ [Y.3521](#): Overview of end-to-end cloud computing management (2016-03)
- ❑ [Y.3522](#): End-to-end Cloud Service Lifecycle Management Requirements (2016-09)



ITU-T Activities on Cloud Computing



- ❑ Elaboration of **Supplement 46 to ITU-T Y.3500-series** on ***"Requirements and Challenges Regarding Provision and Consumption of Cloud Computing Services in Developing Countries"*** by Q5/13: ***"Applying networks of future and innovation in developing countries"***
- ❑ The **Supplement** aims mainly to:
 - present the **situation relating to consumption of CC Services in developing countries** + the **obstacles** encountered + facets that would stimulate **consumption of CC Services** based on experiences from these countries
 - highlight the **current scenarios and the requirements of developing countries** regarding the **provision and deployment** of CC services
 - reveal to what extent **CC Standards** are applied

Two questionnaires for CSPs and CSCS in the developing countries were elaborated and disseminated in order to collect input information for the Supplement

Download link: <https://www.itu.int/rec/T-REC-Y.Sup46-201711-I>



Other ITU-T Activities on Cloud Computing

ITU-T Study Group 11: Signalling requirements, protocols, test specifications and combating counterfeit products

Q13/11

Monitoring parameters for protocols used in emerging networks, including cloud computing and software-defined networking/network function virtualization (SDN/NFV)

Q14/11

Cloud interoperability testing

ITU-T Study Group 17: Security

Q8/17

Cloud computing security

Other ITU-T Activities on Cloud Computing



Approved Recommendations

- ❑ **Q.3914:** Set of parameters of cloud computing for monitoring (2018-01)
- ❑ **Q.4040:** The framework and overview of Cloud Computing interoperability testing (2016-02)
- ❑ **Q.4041:** Cloud computing infrastructure capabilities interoperability testing - part 1: Interoperability testing between CSC and CSP (2018-01)
- ❑ **X.1603:** Data security requirements for the monitoring service of cloud computing (2018-03)
- ❑ **X.1601:** Security framework for cloud computing (2015-09)
- ❑ **X.1602:** Security requirements for software as a service application environments (2016-03)
- ❑ **X.1631:** Information technology - Security techniques - Code of practice for information security controls based on ISO/IEC 27002 for cloud services (2015-04)
- ❑ **X.1641:** Guidelines for cloud service customer data security (2016-09)
- ❑ **X.1642:** Guidelines for the operational security of cloud computing (2016-03)

Download links:

<https://www.itu.int/ITU-T/recommendations/index.aspx?ser=O>

<https://www.itu.int/ITU-T/recommendations/index.aspx?ser=X>



ITU/ALECSO High Level Meeting on Cloud Computing for Education Tunis-Tunisia, 30-31 October 2018

Thank You For Your Attention



Mr. Slaheddine MAAREF
slaheddine.maaref@itu.int