ITU Annual Report 2016

Report on the Implementation of the Strategic Plan and Activities of the Union

October 4, 2017

Contents

Strategic Goals of the Union

The Connect 2020 Agenda was adopted by the 2014 Plenipotentiary Conference as part of ITU's strategic plan for the 2016-2019 quadrennium. At the heart of the Agenda and the ITU Strategic Plan are four goals, relating to:

- Growth – enabling and fostering acceses to and increased use of ICTs.
- Inclusiveness – bridging the digital divide and providing broadband for all.
- Sustainability – managing challenges resulting from ICT development.
- Innovation and partnership – leading, improving and adapting to the changing technology environment.

The four goals include 17 targets, designed to provide an indication of whether each of the goals is being achieved up to 2020 and to help ITU and other stakeholders to focus their priorities during that period.

Goal 1: Growth

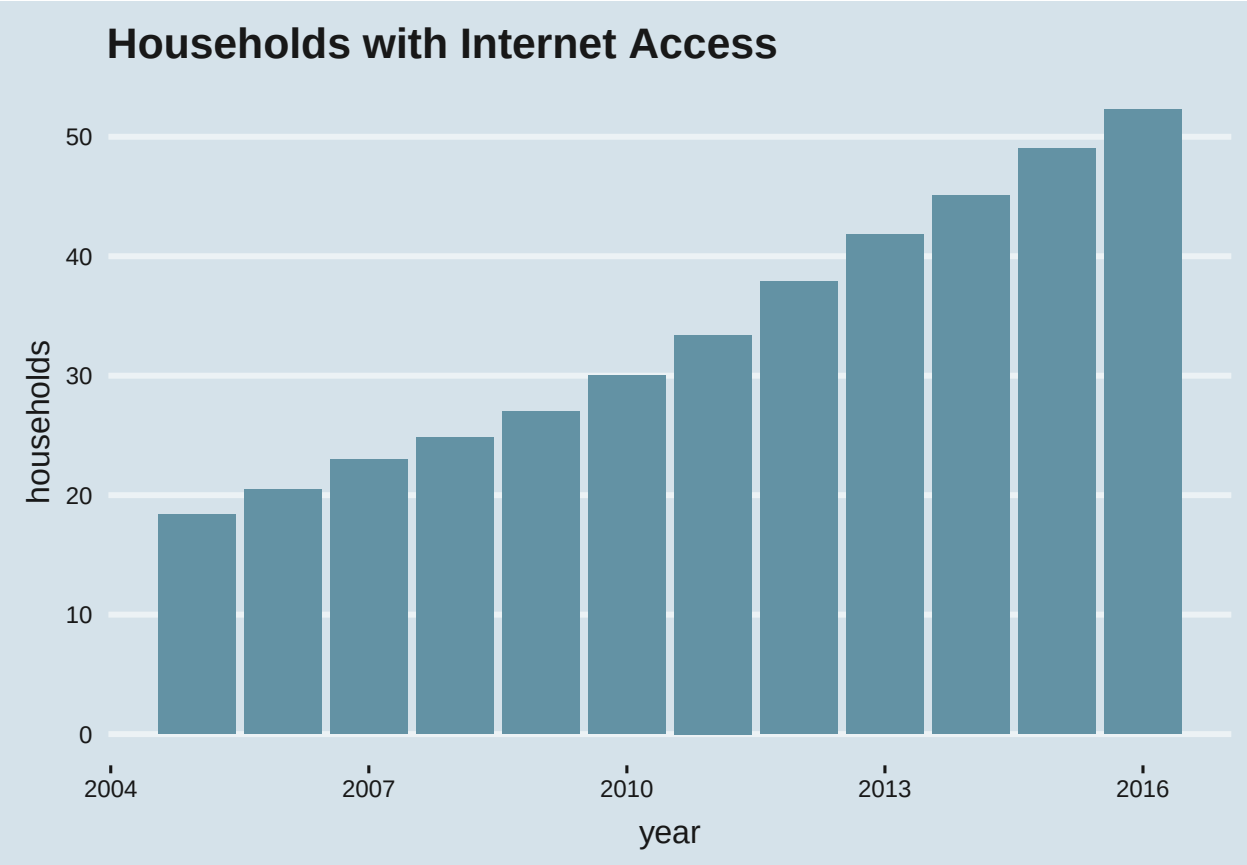
Enabling and fostering access to and increased use of ICTs.

Goal 1: Growth, is measured using the following three targets:

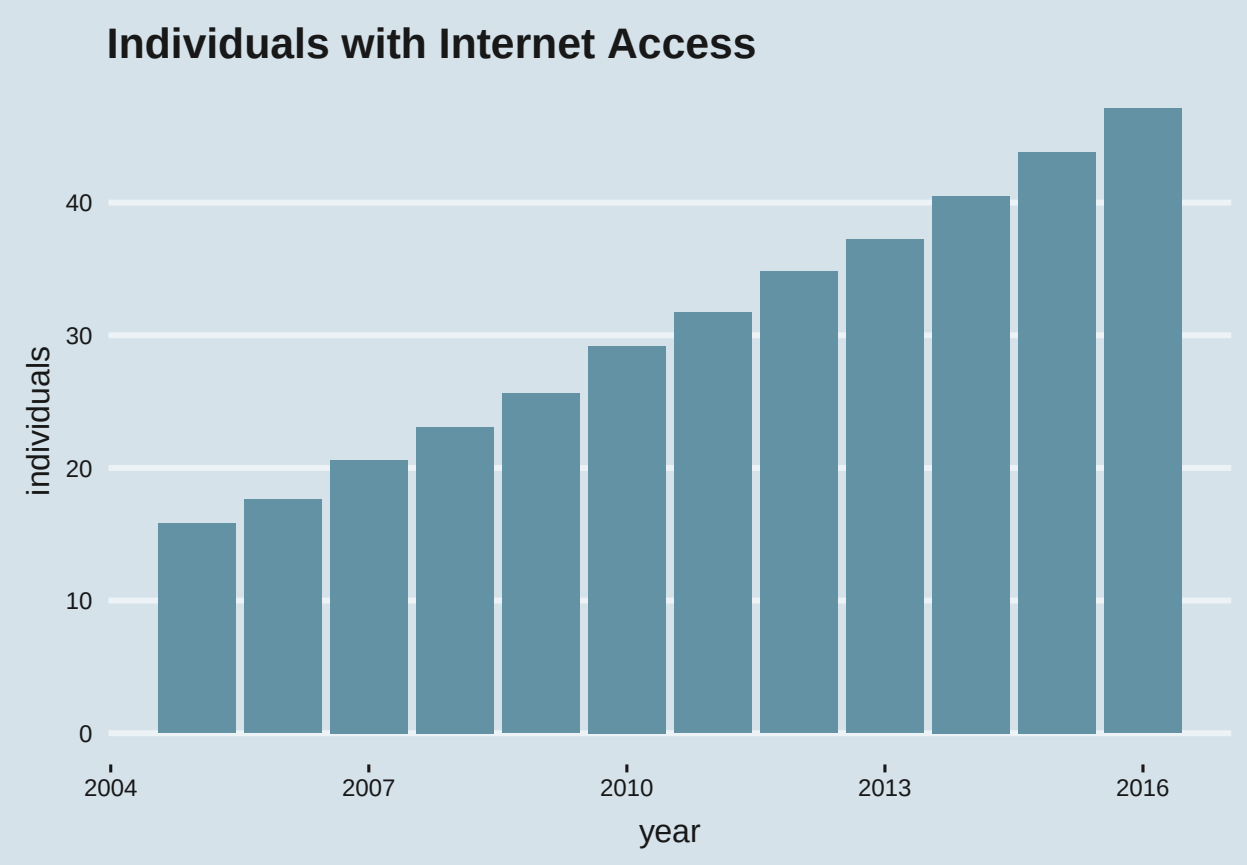
- Target 1.1: Worldwide, 55 per cent of households should have access to the Internet by 2020.

- Target 1.2: Worldwide, 60 per cent of individuals should be using the Internet by 2020.
- Target 1.3: Worldwide, telecommunications/ICTs should be 40 per cent more affordable by 2020.

Target 1.1: Worldwide, 55 per cent of households should have access to the Internet by 2020.



Target 1.2: Worldwide, 60 per cent of individuals should be using the Internet by 2020.



As noted in figures 1 and 2, the indicators used to highlight progress in relation to targets 1.1 and 1.2 show that in 2016, 52.3% of households and 47% of individuals globally are estimated to have access / be using the Internet, two percent and three percent, respectively, more than in 2015.

Target 1.3: Worldwide, telecommunications/ICTs should be 40 per cent more affordable by 2020.

Goal 2: Inclusiveness

Bridging the digital divide and providing broadband for all.

Goal 3: Sustainability

Managing challenges resulting from ICT development.

Goal 4: Innovation and partnership

Lead, improve and adapt to the changing telecommunication/ICT environment.

Radiocommunication Sector Objectives

Following the World Radiocommunication Conference 2015 (WRC-15), the updated version of the Radio Regulations (Edition of 2016) was published in December 2016 and made freely available to the public. The Conference approved various resolutions relating to the preparation of WRC-19 and WRC-23. The preparatory studies requested by these resolutions are being conducted within ITU-R, with the support of the regional groups and other international organizations.

On 12 December 2016 in Geneva, the ITU celebrated the 110th anniversary of the Radio Regulations. This gave the opportunity to showcase 110 years of successful development and implementation of this major treaty, which enables the radiocommunication ecosystem to exist in a sustainable manner. Celebrations included two panel discussions about the ITU Radio Regulations' impact on the ICT industry, and the challenges, opportunities, and future of the ITU Radio Regulations. The event was attended by over 540 participants from 106 countries. Present and former officials of the Union, present and former members of the Radio Regulations Board (RRB), and ITU-R and former CCIR Study Group Chairmen were also present.

Throughout the year, ITU-R continued to process space and terrestrial notices and other related activities. ITU-R software was improved and new applications were delivered.

The Radio Regulations Board met three times and approved new or modified Rules of Procedures related to WRC-15 decisions. Significant progress was registered in the reduction of interference cases from Italy into television services of its neighbors.

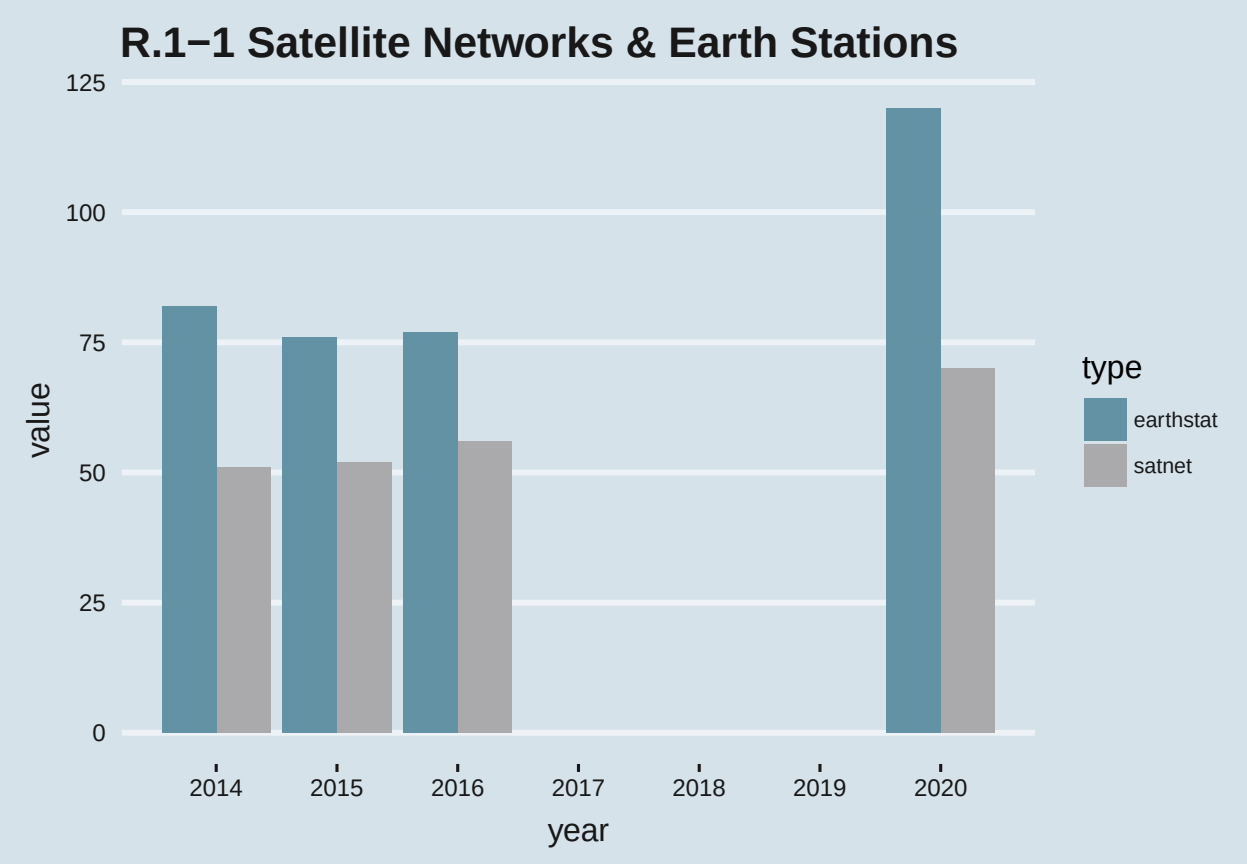
New and revised Recommendations were approved; numerous reports were published. Assistance was provided to members, especially in developing countries, and capacity building activities were carried out including a World Radiocommunication Seminar (WRS-16), two Regional Radiocommunication Seminars and a Small Satellite Symposium, among others.

Objective R.1

Meet, in a rational, equitable, efficient, economical and timely way, the ITU membership's requirements for radio-frequency spectrum and satellite-orbit resources, while avoiding harmful interference.

Outcomes

- R.1-1: Increased number of countries having satellite networks and earth stations recorded in the Master International Frequency Register (MIFR)
- R.1-2: Increased number of countries having terrestrial frequency assignments recorded in the MIFR
- R.1-3: Increased percentage of assignments recorded in the MIFR with favourable finding R.1-4: Increased percentage of countries which have completed the transition to digital terrestrial television broadcasting
- R.1-5: Increased percentage of spectrum assigned to satellite networks which is free from harmful interference
- R.1-6: Increased percentage of assignments to terrestrial services recorded in the MIFR which are free from harmful interference



Outputs

- R.1-1 Final acts of world radiocommunication conferences, updated Radio Regulations
- R.1-2 Final acts of regional radiocommunication conferences, regional agreements
- R.1-3 Rules of Procedure adopted by Radio Regulations Board (RRB)
- R.1-4 Results of the processing of space notices and other related activities
- R.1-5 Results of the processing of terrestrial notices and other related activities
- R.1-6 RRB decisions other than the adoption of Rules of Procedure
- R.1-7 Improvement of ITU-R software

R.1-1 Final acts of world radiocommunication conferences, updated Radio Regulations

- Following the World Radiocommunication Conference 2015 (WRC-15), the updated version of the Radio Regulations (Edition of 2016) was published in December 2016 and made freely available to the public.
- The Conference took a number of decisions, which are reflected in the updated Radio Regulations or recorded in the minutes of its plenary sessions. In particular, the Conference approved various resolutions relating to the preparation of WRC-19 and WRC-23. The preparatory studies requested by these resolutions are being conducted within ITU-R, with the support of the regional groups and other international organizations, and address the following topics:
- Earth stations on board unmanned aircraft [3]
- Earth stations in motion, Non-geostationary systems in the fixed-satellite service, High-altitude platform stations (HAPS)
- International Mobile Telecommunications (IMT)
- Wireless Access Systems including radio local area networks (R-LAN)

- Intelligent Transport Systems (ITS)
- Meteorological-satellite and Earth exploration-satellite services (space-to-Earth)
- Machine-type communication infrastructures

R.1-2 Final acts of regional radiocommunication conferences, regional agreements

No regional radiocommunication conferences were organized during the considered period.

R.1-3 Rules of Procedure adopted by Radio Regulations Board (RRB)

The RRB met three times in 2016 and adopted 32 new or revised Rules of Procedure (RoPs) relating to decisions by WRC-15 or practice by the Bureau on the application of the Radio Regulations and Regional Agreements. Furthermore, a list of proposed new or revised RoPs is being maintained for the period 2016 – 2019 (see Document RRB16-2/3(Rev.4)).

R.1-4 Results of the processing of space notices and other related activities

The processing of space notices covered the following elements:

- 1,336 Advance Publication Information
- 401 requests for coordination for non-planned services, for which the treatment time increased beyond the four-month regulatory time limit, up to a maximum of 8 months, due to the unusually large number of submissions received at the end of WRC-15 and six month later as a result of the new allocations to FSS decided by WRC-15 and of the necessary modifications in processing software to reflect these decisions.
- 166 recordings of satellite networks in the MIFR
- 505 recordings of earth stations in the MIFR
- 41 requests for inclusion and 34 recordings in Appendices 30/30A Regions 1 and 3 Lists, 30 notifications pursuant to Article 5 of Appendices 30/30A.
- 42 requests for inclusion and 7 recordings in the Appendices 30B List, 7 notifications pursuant to Article 8 of Appendix 30B.
- 106 Due Diligence Information
- Cost recovery (CHF 15.6 million)
- 283 suppressions of satellite network filings, for not meeting the regulatory deadlines or the due diligence obligations, with the consent of the RRB, where appropriate.
- 77 cases of assistance provided to administrations for space stations and 368 for earth stations.
- 26 reports of harmful interference.

R.1-5 Results of the processing of terrestrial notices and other related activities

The processing of terrestrial notices covered the following elements: 215 258 terrestrial notices for recording in the Master International Frequency Register and frequency Plans;

- 2 994 notifications containing 596 543 coast and ship stations for recording in the ITU maritime database;
- 12 341 high frequency broadcasting requirements.
- Maintenance of the reference databases on emergency communications, oceanographic radars, means of station identification, geographical and administrative data.
- 154 monitoring observations in the context of the monitoring program in the frequency band 406-406.1 MHz;
- 48 832 monitoring observations in the context of the monitoring program in the frequency bands between 2 850 kHz and 28 000 kHz.
- 4 434 reports of harmful interference.

R.1-6 RRB decisions other than the adoption of Rules of Procedure

The RRB examined a number of requests relating to various terrestrial and satellite networks, and cases of harmful interference. This activity covered the following elements:

- Suppression from the Master Register of frequency assignments of one satellite network pursuant to No. 13.6 of the RR, and maintenance of the frequency assignments of two other satellite networks.
- Extension of the regulatory deadline for bringing into use (BIU) of the frequency assignments of seven satellite networks, two of which were cases of co-passenger delay and four cases of force majeure. Rejection of one request to extend the deadline for one other satellite network. Rejection of a request to extend the regulatory deadline for electric propulsion satellites.
- Rejection of a request to reinstate a satellite network in the absence of replies to coordination requests.
- Reinstating of a satellite network following reference to CS Article 48 by the notifying administration.
- Re-instating of two satellite networks with unchanged date of receipt. Rejection of a request to change the date of receipt of a satellite filing.
- Rejection of a request to transfer the function of Notifying Administration for four satellite networks to another administration.
- Regular review by the RRB of the situation of harmful interference. With respect to the interference caused by Italian TV stations in the UHF band, a 3-year legal, financial and regulatory effort by the Italian administration resulted in the successful switch-off of Italian TV transmissions on 61 frequencies that had been causing harmful interference to the services of other countries.

R.1-7 Improvement of ITU-R software

The BR develops, updates and maintains a significant number of software applications and databases to assist in the implementation of the Radio Regulations and Rules of Procedure, and in particular to enable timely processing, examination and publication of the relevant terrestrial frequency notifications and satellite network filings. In order to take into account the evolution of the Radio Regulations and associated Rules of Procedure, the evolution of technology and security factors, these software applications and databases need continuing development and maintenance. In 2016, the ITU-R software and data bases benefited from the following elements:

- Migration of the Global Administration Data System (GLAD) database from Ingres to SQL server, development of a new interface for updating GLAD information and creation of a new layout for the publication of GLAD information on the web.
- Development of a web application providing online access to the MIFR for all terrestrial services.
- Delivery of new and/or improved versions of space services processing software for external use (BR IFIC (Space)).
- Delivery of a new space services database scheme design, in response to WRC-15 and RRB decisions. The software and the new database were presented to the membership at WRS-16 and through circular letters CR/389, CR/393, CR/394, CR/403, and CR/411.
- Integration of two third-party software packages into the space services technical examinations software suite (GIBC), to allow for equivalent power-flux density (EPFD) validation calculations. This was presented to membership at WRS-16 and through circular letters CR/405 and CR/414.
- Maintenance of the SpaceWISC system for online submission and publication of advance publication information for space services networks subject to coordination. In parallel, a new system has been developed to implement the extension of the scope of Resolution 908 (WRC-12) from API to coordination and notification, as decided by WRC-15. The first deliverable is the as-received publication web site mentioned in circular letters CR/401 and CR/415.
- Steps toward the implementation of a database and corresponding web application for submission and publication of harmful interference reports for space services (SIRRS). The look and feel of the system was presented to membership at WRS-16 and the system will be available for external testing by the end of first quarter 2017.
- Delivery of new and updated versions of the reference databases (including new data and schemes) needed for the technical and regulatory examinations by the BR of terrestrial frequency assignments

in the bands shared between terrestrial and space services, taking into account WRC-15 and RRB decisions.
- At the request of WP4A (Doc. 4A/669 Annex 14), implementation of changes in the way affected networks are indicated in the space systems technical examination software and database and made available a new website with information on affected networks (Notex). This new functionality was described in CR/397.
- Delivery of new and updated versions of all terrestrial services processing software, both for internal (TerRaSys) and external (BR IFIC (Terrestrial)) use, including improved database schemas and updated validation and examination software modules for the submission of terrestrial frequency notifications, as a consequence of WRC-15 and RRB decisions. The software enhancements and new requirements were presented to membership at WRS-16 and through the relevant circular letters.
- Development of an updated version of the Radio Regulations Navigation Tool, in order to incorporate the new version of the Radio Regulations and other relevant texts. The software was presented to membership at WRS-16.
- Delivery of a new software tool for the electronic display and analysis of RR5 Table of Frequency Allocations and associated footnotes. The software was presented to membership at WRS-16 and entered a joint beta test phase with the membership.
- Continuation of the work for improving the security of software applications and databases, as per the recommendations of the Radiocommunications A

Objective R.2

Provide for worldwide connectivity and interoperability, improved performance, quality, affordability and timeliness of service and overall system economy in radiocommunications, including through the development of international standards.

Objective R.3

Foster the acquisition and sharing of knowledge and know-how on radiocommunications.

Telecommunication Standardization Sector Objectives

- The ITU-T Focus Group on network aspects of IMT-2020 ('5G') has concluded its preliminary study into the wireline networking innovations required to achieve the ambitious performance targets of 5G systems. The group's output takes the form of five draft ITU international standards and four draft ITU technical reports to drive related work in ITU's standardization expert groups (ITU-T Study Groups). The Focus Group's final meeting in December 2016 hosted a "workshop and demo day" showcasing proofs of concept and demonstrations of the wireline technologies to enable future 5G systems.
- The ITU-T Focus Group on Digital Financial Services has concluded its work with the publication of 85 policy recommendations and 28 supporting thematic reports. The Focus Group brought together more than 60 organizations from over 30 countries to drive greater financial inclusion for the estimated 2 billion people still without access to a bank account.
- ITU-T has completed a set of highly anticipated broadband access technologies. G.fast was updated in 2016 to achieve up to 2 Gbit/s access speeds over traditional telephone wires. A new series of standards for 40-Gigabit-capable Fiber to the Home (NG-PON2) are the first to provide fiber-optic access speeds beyond 10 Gbit/s. ITU-T boasts another major recent achievement in the revision of a key ITU standard underlying the Optical Transport Network, concluding a three-year process to enable optical transport at rates higher than 100 Gbit/s.
- Now in its fourth edition, ITU H.265 'High Efficiency Video Coding' – the successor to the Primetime Emmy award-winning ITU H.264 'Advanced Video Coding' – offers double the compression power of H.264 to provide the platform for the next decade of innovation in video. ITU-T Study Group 16 and

the ISO/IEC Moving Picture s Expert Group are inviting experts to submit evidence supporting the case for a future video coding standard beyond today's ITU H.265.
- The United for Smart Sustainable Cities (U4SSC) initiative was established, primarily to advocate for public policy to ensure that ICTs play a definitive role in smart cities. U4SSC is supported by 16 United Nations agencies and programmes and is open to the participation of all stakeholders interested in driving smart-city innovation. The collaboration driven by this initiative has led 51 cities to join the pilot project implementing ITU's Key Performance Indicators for Smart Sustainable Cities.
- Held in Hammamet, Tunisia, from 25 October to 3 November 2016, WTSA-16 produced 16 new resolutions, 31 revised resolutions and 5 new standards. The directives of WTSA-16 call for ITU to expand its study of the wireline networking innovations necessary to support 5G systems. ITU members also reaffirmed the importance of ITU standardization work for ultra-high-speed transport networks, future video technologies, IoT, and smart cities and communities.

Objective T.1

Develop non-discriminatory international standards (ITU-T recommendations), in a timely manner, and foster interoperability and improved performance of equipment, networks, services and applications.

Outcomes

- T.1-1: Increased utilization of ITU-T recommendations
- T.1-2: Improved conformance to ITU-T recommendation
- T.1-3: Enhanced standards in new technologies and services

Outputs

- T.1-1 Resolutions, recommendations and opinions of the World Telecommunication Standardization Assembly (WTSA)
- T.1-2 WTSA regional consultation sessions T.1-3 Advice and decisions of Telecommunication Standardization Advisory Group (TSAG)
- T.1-4 ITU-T recommendations and related results of ITU-T study groups
- T.1-5 ITU-T general assistance and cooperation
- T.1-6 Conformity database
- T.1-7 Interoperability test centres and events
- T.1-8 Development of test suites

Objective T.2

Promote the active participation of the membership, in particular developing countries, in the definition and adoption of non-discriminatory international standards (ITU-T recommendations) with a view to bridging the standardization gap.

Objective T.3

Ensure effective allocation and management of international telecommunication numbering, naming, addressing and identification resources in accordance with ITU-T recommendations and procedures.

Objective T.4

Foster the acquisition and sharing of knowledge and know-how on the standardization activities of ITU-T.

Objective T.5

Extend and facilitate cooperation with international, regional and national standardization bodies.

Telecommunication Development Sector Objectives

Inter-Sectoral Objectives

Enablers by General Secretariat