International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

WORLD TELECOMMUNICATION STANDARDIZATION
ASSEMBLY
Geneva, 1-9 March 2022

Resolution 2 – ITU Telecommunication Standardization Sector study group responsibility and mandates

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.

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RESOLUTION 2 (Rev. Geneva, 2022)

ITU Telecommunication Standardization Sector study group responsibility and mandates

(Helsinki, 1993; Geneva, 1996; Montreal, 2000; Florianópolis, 2004;
Johannesburg, 2008; 2009[1]; Dubai, 2012; 2015[2]; 2016[3]; Hammamet, 2016; Geneva, 2022)

The World Telecommunication Standardization Assembly (Geneva, 2022),

recognizing

a)   that the ITU Telecommunication Standardization Sector (ITU-T) is entitled to study and develop outputs on technical, economic and policy issues related to the telecommunication/information and communication technology (ICT) field, as stated in Articles 17, 18, 19, 20 of the ITU Constitution and Articles 13, 14, 14A, 15 and 20 of the ITU Convention;

b)   relevant resolutions of the ITU Plenipotentiary Conference which mandate ITU-T to study and develop outputs, including Recommendations, in many areas;

c)   that new and emerging technologies will have a noticeable impact on telecommunications/ICTs, and ITU-T needs to address the interests of its membership by keeping pace with these advances in technology to advance telecommunications/ICT;

d)   the resolutions adopted by this assembly, which contain many instructions and implications for the work of the relevant study groups,

considering

a)   that the mandate for each study group needs to be clearly defined in order to minimize duplication of work between study groups and to ensure the coherence of the overall work programme of ITU-T;

b)   that ITU-T has to evolve in order to stay relevant to the changing telecommunication environment and to its membership interests;

c)   that collocation of study group, working party or rapporteur group meetings has also been a means to minimize duplication of work and to improve efficiency of work; in practice, collocation enables:

–   attendees' participation in the work of more than one study group;

–   reduction in the need for exchange of liaison statements between the study groups concerned;

–   saving costs for ITU and for ITU members and other experts;

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[1]   Changes to the ITU-T Study Group 5 mandate agreed by TSAG on 30 April 2009.

[2]   Creation of ITU-T Study Group 20 by TSAG on 5 June 2015.

[3]   Changes to the ITU-T Study Group 20 lead study group role agreed by TSAG on 5 February 2016.

d)   that the World Telecommunication Standardization Assembly (WTSA), through Resolution 22, assigns authority to the Telecommunication Standardization Advisory Group (TSAG) in the interval between WTSAs to restructure and establish ITU-T study groups in response to changes in the telecommunication marketplace,

noting

that the study group structure, responsibilities and mandates agreed at WTSA may be modified in the interval between WTSAs, and that the current study group structure, responsibility and mandates may be found on the ITU-T website or obtained from the Telecommunication Standardization Bureau (TSB),

resolves

1   that the mandate of each study group, which it shall use as the basis for organizing its study programme, taking into account *recognizing a), b), c),* and *d)* above, shall consist of:

–   a general area of responsibility, as set out in Annex A to this resolution, within which the study group may amend existing Recommendations, in collaboration with other groups, as appropriate; and

–   a set of Questions related to particular areas of study, which are compatible with the general area of responsibility and which should be results-oriented (refer to Section 7 of Resolution 1 (Rev. Geneva, 2022) of this assembly);

2   to encourage the study groups to consider collocation (e.g. of study group plenaries, working parties or rapporteur meetings) as a means to improve cooperation in some areas of work; the study groups involved will need to identify the areas in which they need to cooperate, based on their mandates, and keep TSAG and TSB informed;

3   to encourage ITU-T study groups to conduct work on how to ensure wider implementation of ITU-T Recommendations at the national level in collaboration with the study groups of the ITU Telecommunication Development Sector;

instructs the Telecommunication Standardization Bureau

to support and facilitate the operational aspects of such collocation.

ANNEX A
(to Resolution 2 (Rev. Geneva, 2022))

PART 1 – GENERAL AREAS OF STUDY

ITU-T Study Group 2

Operational aspects of service provision and telecommunication management

ITU-T Study Group 2 is responsible for studies relating to:

•   continued deployment of numbering, naming, addressing and identification (NNAI) requirements and resource assignment, including criteria and procedures for reservation, assignment and reclamation;

- evolution of and specification of use of NNAI requirements and resource assignment, including criteria and procedures for reservation, assignment and reclamation for future telecommunication/ICT architectures, capabilities, technologies, applications and services;

- principles of administering global NNAI resources;

- principles and operational aspects of routing, interworking, number portability and carrier switching;

- principles of service provision, definition and operational requirements for current and future telecommunication/ICT architectures, capabilities, technologies, applications and services;

- operational and management aspects of networks, including network traffic management, designations and transport-related operations procedures;

- operational aspects of interworking between traditional telecommunication networks and evolving and emerging telecommunication/ICT architectures, capabilities, technologies, applications and services;

- evaluation of feedback from operators, manufacturing companies and users on different aspects of network operation;

- management of future telecommunication/ICT architectures, capabilities, technologies, applications and services;

- evolution of the management interface specification methodology;

- specifying interfaces to management systems to support the communication of identity information within or between organizational domains; and

- the operational impact of the Internet, convergence (services or infrastructure) and future services, such as over-the-top (OTT), on international telecommunication services and networks.

ITU-T Study Group 3

Tariff and accounting principles and international telecommunication/ICT economic and policy issues

ITU-T Study Group 3 is responsible, *inter alia*, for studying international telecommunication/ICT policy and economic issues and tariff and accounting matters (including costing principles and methodologies), with a view to informing the development of enabling regulatory models and frameworks. To this end, Study Group 3 shall in particular foster collaboration among its participants with a view to the establishment of rates at levels as low as possible consistent with an efficient service and taking into account the necessity of maintaining independent financial administration of telecommunications on a sound basis. Additionally, Study Group 3 will study the economic and regulatory impact of the Internet, new and emerging technologies, convergence (services or infrastructure) and new services, such as over-the-top (OTT), on international telecommunication services and networks.

ITU-T Study Group 5

Electromagnetic fields, environment, climate action, sustainable digitalization and circular economy

ITU-T Study Group 5 is responsible for the development of standards on the environmental aspects of ICT and digital technologies and protection of the environment, including electromagnetic phenomena and climate change.

Study Group 5 will study how the digital transformation can be shaped to ensure it supports transitions towards more sustainable societies.

Study Group 5 will also study issues related to resistibility, human exposure to electromagnetic fields (EMF), circular economy, energy efficiency and climate-change adaptation and mitigation. It will develop international standards, guidelines, technical papers and assessment frameworks that support the sustainable use and deployment of ICTs and digital technologies, and evaluate the environmental performance, including biodiversity, of digital technologies such as, but not limited to, 5G, artificial intelligence (AI), smart manufacturing, automation, etc.

Study Group 5 is also responsible for studying design methodologies and frameworks to reduce the volume and adverse environmental effects of e-waste and to support the transition towards a circular economy.

Study Group 5 has an extended role in evaluating the impact of ICTs in accelerating climate-change adaptation and mitigation actions, particularly in industries (including the ICT sector), cities, rural areas and communities. To this end, it is also working to develop standards and guidelines for building resilient ICT infrastructures in rural areas and communities, as well as to develop assessment methodologies for the trajectories of the ICT sector in connection with the United Nations Sustainable Development Agenda 2030 and the Paris Agreement.

In addition to its climate-focused activities, Study Group 5 has five other objectives. The first is to protect ICT (including telecommunication equipment and installations) against damage and malfunction due to electromagnetic phenomena, such as lightning, as well as from particle radiations. In this field, Study Group 5 is one of the world's most experienced and respected standardization bodies. The second is to ensure safety of personnel and users of networks in relation to electrical hazards existing in ICT networks. The third is to avoid health risks from EMF produced by telecommunication devices and installations. Study Group 5 will develop standards to give operators, manufacturers, and government agencies the tools required to assess EMF levels and to verify compliance with the World Health Organization (WHO) recommended human exposure guidelines and limits. The fourth is to guarantee good reliability and low latency for high-speed network services by providing requirements on resistibility and electromagnetic compatibility (EMC). The fifth is EMC, which is another key component of Study Group 5's work, by ensuring that the functionality of telecommunication equipment is not compromised by electromagnetic interference related to radiated and conducted disturbances emitted by other electrical or communications systems. EMC is becoming particularly relevant in taking into account the convergence of telecommunication and IT equipment, as well as in ensuring the efficient operation of home networks.

Study Group 5 is responsible for studies on how to use ICTs and digital technologies to tackle environmental challenges in line with the Sustainable Development Goals (SDGs).

ITU-T Study Group 9

Audiovisual content transmission and integrated broadband cable networks

ITU-T Study Group 9 is responsible for studies relating to:

• use of telecommunication systems for contribution, primary distribution and secondary distribution of audiovisual content, e.g. television programmes and related data services, including interactive services and applications, providing advanced capabilities, e.g. ultra-high definition and high-dynamic range, 3D, virtual reality, augmented reality and multiview;

• use of cable networks, e.g. coaxial cable, optical fibre, hybrid fibre coaxial (HFC), etc., to also provide integrated broadband services. The cable network, primarily designed for audiovisual content delivery to the home, also carries time-critical services like voice, gaming, video-on-demand, interactive and multiscreen services, etc. to customer premises equipment (CPE) in the home or enterprise;

• use of cloud computing, artificial intelligence (AI) and other advanced technologies to enhance audiovisual content contribution and distribution as well as integrated broadband services over the cable networks;

• use of accessibility services (like captioning, audio caption) and new interaction technologies (like haptic, gesture, eye tracking and so on) to enhance accessibility of audiovisual content and related data services for people with different ranges of abilities.

ITU-T Study Group 11

Signalling requirements, protocols, test specifications and combating counterfeit telecommunication/ICT devices

ITU-T Study Group 11 has been attributed the responsibility for studies related to signalling-system architecture, signalling requirements and protocols, for all types of networks such as future networks (FN), cloud-computing networks, VoLTE/ViLTE-based network interconnection, virtual networks, multimedia, next-generation networks (NGN), signalling for legacy network interworking, satellite-terrestrial networks, software-defined networking (SDN) technologies, network function virtualization (NFV) technologies, IMT-2020 networks and beyond, quantum key distribution network (QKDN) and related technologies, and augmented reality.

Study Group 11 is also responsible for studies to combat counterfeit telecommunication/ICT devices and mobile device theft.

Study Group 11 will also develop test specifications for testing conformance and interoperability (C&I) for all types of networks, technologies and services, a testing methodology and test suites for standardized network parameters in relation to the framework for Internet-related performance measurement, as well as for existing and emerging technologies.

In addition, Study Group 11 will study a way to implement a testing laboratory recognition procedure in ITU-T through the work of the ITU-T Conformity Assessment Steering Committee (CASC).

ITU-T Study Group 12

Performance, quality of service and quality of experience

ITU-T Study Group 12 is responsible for Recommendations on performance, quality of service (QoS) and quality of experience (QoE) for the full spectrum of terminals, networks, services and applications ranging from speech over fixed circuit-based networks to multimedia applications over networks that are mobile and packet based. Included in this scope are the operational aspects of performance, QoS and QoE; the end-to-end quality aspects of interoperability; and the development of multimedia quality assessment methodologies, both subjective and objective.

ITU-T Study Group 13

Future networks and emerging network technologies

ITU-T Study Group 13 is responsible for studies relating to the requirements, architectures, capabilities and application programming interfaces (APIs) as well as softwarization and orchestration aspects of converged future networks (FN), including the application of machine learning technologies. It develops standards related to information-centric networking (ICN) and content-centric networking (CCN). Regarding IMT-2020 and beyond, it particularly focuses on non-radio related parts. Study Group 13's responsibility also includes IMT-2020 and beyond project management coordination across all ITU-T study groups, and release planning.

It is also responsible for studies relating to future computing, including cloud computing and data handling in telecommunication networks. This covers capabilities and technologies from the network side to support data utilization, exchange, sharing, and data quality assessment and computing-aware networking, as well as end-to-end awareness, control and management of future computing, including cloud, cloud security and data handling.

Study Group 13 studies aspects relating to fixed, mobile and satellite convergence for multi-access networks, mobility management, and enhancements to existing ITU-T Recommendations on mobile communications, including the energy-saving aspects. It develops standards for quantum key distribution networks (QKDN) and related technologies. It further studies the concepts and mechanisms to enable trusted ICT, including framework, requirements, capabilities, architectures and implementation scenarios of trusted network infrastructures and trusted cloud solutions in coordination with all study groups concerned.

ITU-T Study Group 15

Networks, technologies and infrastructures for transport, access and home

ITU-T Study Group 15 is responsible in ITU-T for the development of standards for the optical transport network, access network, home network and power utility network infrastructures, systems, equipment, optical fibres and cables. This includes related installation, maintenance, management, test, instrumentation and measurement techniques, and control plane technologies to enable the evolution toward intelligent transport networks, including the support of smart-grid applications.

ITU-T Study Group 16

Multimedia and related digital technologies

ITU-T Study Group 16 is responsible for studies relating to ubiquitous multimedia applications, multimedia capabilities, multimedia services and multimedia applications for existing and future networks.

This encompasses ICTs for multimedia systems, applications, terminals and delivery platforms; accessibility for digital inclusion; ICTs for active assisted living; human interfaces; multimedia aspects of distributed ledger technologies; media and signal coding and systems; and digital multimedia services in various verticals (health, culture, mobility, etc.).

NOTE – When ITU-T Study Group 16 was created in 1996, one of its mandates was to continue ITU-T Study Group 1's studies on multimedia services. Accordingly, reference to "services" in the context of Study Group 16's mandate is to be understood as "multimedia services".

ITU-T Study Group 17

Security

ITU-T Study Group 17 is responsible for building confidence and security in the use of ICTs.

Providing security by ICTs and ensuring security for ICTs are both major study areas for Study Group 17. This includes studies relating to cybersecurity, managed security services, endpoint detection and response, security management, countering spam and identity management. It also includes security architecture and framework, quantum-based security, distributed ledger technology (DLT) security, intelligent transport system (ITS) security, security aspects related to artificial intelligence (AI), and security of networks, applications and services such as Internet of things (IoT) and smart cities, various kinds of networks including IMT-2020/5G and beyond, smart grid, industrial control systems (ICS), supply chain, smartphone, software-defined networking (SDN), network function virtualization (NFV), Internet Protocol television (IPTV), web services, over-the-top (OTT), social network, cloud computing, big data analytics, digital financial system (DFS) and telebiometrics.

Building confidence and security in the use of ICTs also includes protecting personally identifiable information (PII), such as technical and operational aspects of data protection with respect to ensuring confidentiality, integrity and availability of PII.

Study Group 17 is also responsible for the application of open system communications, including directory and object identifiers, and for technical languages, the method for their usage and other issues related to the software aspects of telecommunication systems, and for test specification languages in support of conformance testing to improve the quality of Recommendations.

ITU-T Study Group 20

Internet of Things and smart cities and communities

Study Group 20 is responsible for studies relating to Internet of Things (IoT) and its applications, and smart cities and communities (SC&C). This includes studies relating to big data aspects of IoT and SC&C, digital services for SC&C, and digital transformation relevant IoT and SC&C aspects.

PART 2 – LEAD ITU-T STUDY GROUPS IN SPECIFIC AREAS OF STUDY

SG2   Lead study group on numbering, naming, addressing and identification
Lead study group on administration of global numbering, naming, addressing and identification resources
Lead study group on routing and interworking
Lead study group on number portability and carrier switching
Lead study group on telecommunication/ICT capabilities and applications
Lead study group on telecommunication/ICT service definition
Lead study group on telecommunications for disaster relief/early warning, network resilience and recovery
Lead study group on telecommunication management

SG3   Lead study group on tariff and accounting principles relating to international telecommunications/ICT
Lead study group on economic issues relating to international telecommunications/ICT
Lead study group on policy issues relating to international telecommunications/ICT

SG5   Lead study group on electromagnetic compatibility, resistibility and lightning protection
Lead study group on soft error caused by particle radiations
Lead study group on human exposure to electromagnetic fields
Lead study group on circular economy and e-waste management
Lead study group on ICTs related to the environment, energy efficiency, clean energy and sustainable digitalization for climate actions

SG9   Lead study group on integrated broadband cable networks
Lead study group on audiovisual content delivery over cable networks

SG11   Lead study group on signalling and protocols
Lead study group on establishing test specifications, conformance and interoperability testing for all types of networks, technologies and services that are the subject of study and standardization by all ITU-T study groups
Lead study group on combating counterfeiting of ICT devices
Lead study group on combating the use of stolen ICT devices

SG12   Lead study group on quality of service and quality of experience
Lead study group on driver distraction and voice aspects of car communications
Lead study group on quality assessment of video communications and applications

SG13   Lead study group on future networks such as IMT-2020 networks and beyond (non-radio related parts)
        Lead study group on fixed-mobile convergence
        Lead study group on cloud computing
        Lead study group on machine learning

SG15   Lead study group on access network transport
        Lead study group on home networking
        Lead study group on optical technology

SG16   Lead study group on multimedia technologies, applications, systems and services
        Lead study group on IP-based television services and digital signage
        Lead study group on human factors and ICT accessibility for digital inclusion
        Lead study group on multimedia aspects of automotive-related intelligent services
        Lead study group on multimedia aspects of digital health
        Lead study group on digital culture
        Lead study group on multimedia aspects of distributed ledger technology and its applications

SG17   Lead study group on security
        Lead study group on identity management
        Lead study group on languages and description techniques

SG20   Lead study group on Internet of Things and its applications
        Lead study group on smart cities and communities and related digital services
        Lead study group for Internet of Things identification
        Lead study group on digital health related to Internet of Things and smart cities and communities

ANNEX B
(to Resolution 2 (Rev. Geneva, 2022))

Points of guidance to ITU-T study groups for development of the post-2022 work programme

B.1   This annex provides points of guidance to study groups for the development of post-2022 study Questions in accordance with their proposed structure and general areas of responsibility. The points of guidance are intended to clarify, where appropriate, interaction between study groups in certain areas of common responsibility, and are not intended to provide a comprehensive list of such responsibilities.

B.2   This annex will be reviewed by the Telecommunication Standardization Advisory Group (TSAG) as necessary to facilitate interaction between study groups, to minimize duplication of effort and to harmonize the overall ITU-T work programme.

ITU-T Study Group 2

ITU-T Study Group 2 is the lead study group for numbering, naming, addressing and identification (NNAI), routing and interworking, and service definition (including future telecommunication/ICT architectures, capabilities, technologies, applications and services) and will continue to be responsible for creating principles of service and operational requirements, including NNAI aspects, billing and operational quality of service/network performance. Service principles and operational requirements will also continue to be developed for current and evolving telecommunications/ICTs.

Study Group 2 is responsible for studying, developing and recommending general principles of NNAI as well as routing for all types of future and evolving telecommunication/ICT architectures, capabilities, technologies, applications and services and operational aspects relating to end-to-end routing for all types of current and future networks.

Study Group 2 is responsible for studying, developing and recommending general principles and operational aspects related to interworking, number portability and carrier switching.

Study Group 2 will study and describe services and capabilities from a user's point of view to facilitate global interconnection and interoperation and, to the extent practicable, ensure compatibility with the International Telecommunication Regulations and related intergovernmental agreements.

Study Group 2 should continue to study service policy aspects, including those that may arise in the operation and provision of transborder, global and/or regional services, taking due account of national sovereignty.

The chairman of Study Group 2 (or, if necessary, the chairman's delegated representative), and the designated advisers through the Numbering Coordination Team (NCT), shall provide technical advice to the Director of TSB concerning general principles for NNAI, assignment, reassignment and/or reclamation of international NNAI directly assigned global resources and routing, and the effect on allocation of directly assigned NNAI resources.

Study Group 2 shall provide the Director of TSB with advice on technical, functional and operational aspects in the assignment, reassignment and/or reclamation of international numbering and addressing resources in accordance with the relevant ITU-T E- and F-series Recommendations, taking into account the results of any ongoing studies, or requests raised by NCT.

Study Group 2 should recommend measures to be taken to ensure operational performance of all networks (including network management) in order to meet the requisite in-service network performance and quality of service.

As the lead study group on telecommunication management, Study Group 2 is also responsible for the development and maintenance of a consistent ITU-T work plan, prepared with the cooperation of relevant ITU-T study groups, on activities associated with telecommunication management and with operations, administration and management (OAM). In particular, this work plan will focus on activities involving two types of interfaces:

•	fault, configuration, accounting, performance and security management (FCAPS) interfaces between network elements and management systems, and between management systems; and

•	transmission interfaces between network elements.

In support of market-acceptable FCAPS interface solutions, Study Group 2 studies will identify service-provider and network-operator requirements and priorities for telecommunication management, continue the evolution of the telecommunication management framework currently based on telecommunication management network (TMN), next-generation network (NGN), software-defined networking (SDN) and network function virtualization (NFV) concepts, and address the management of NGN, cloud computing, future networks (including future telecommunication/ICT architectures, capabilities, technologies, applications and services), SDN, NFV, IMT-2020 and distributed ledger technology (DLT).

Study Group 2 will study FCAPS interface solutions that will specify reusable management information definitions via protocol-neutral techniques, continue management information modelling for the major telecommunication technologies, such as optical and IP-based networking, and extend management technology choices consistent with market needs, industry recognized value, and major emerging technical directions.

Additional studies will also cover network and service operational requirements and procedures, including support for network traffic management, support for the Service and Network Operations (SNO) group, and designations for interconnections among network operators.

To support the generation of such interface solutions, Study Group 2 will strengthen the collaborative relationships with standards-development organizations, forums, consortia and other experts as appropriate.

Study Group 2 will work on relevant identification aspects in collaboration with Study Group 20 for Internet of Things (IoT) and with Study Group 17, as per the mandate of each study group.

ITU-T Study Group 3

ITU-T Study Group 3 should study and develop Recommendations, technical reports, handbooks and other publications for members to respond positively and proactively to the development of international telecommunication/ICT markets, in order to ensure that policy and regulatory frameworks remain supportive of innovation, competition and investment, for the benefit of users and the global economy.

In particular, Study Group 3 should ensure that tariffs, economic policies and regulatory frameworks related to international telecommunication/ICT services and networks are forward-looking and serve to encourage take-up and use, as well as industry innovation and investment. Furthermore, these frameworks need to be adequately flexible to adjust to rapidly evolving markets, technologies, and business models, while ensuring the necessary competitive safeguards and the protection of consumers.

In this context, the work of Study Group 3 should also consider new and emerging technologies and services so its work will help drive new economic opportunities and enhance societal benefits in different areas, including health care, education and sustainable development.

Study Group 3 should study and develop appropriate instruments, with a view to creating an enabling policy environment for the transformation of markets and industries, through the promotion of open, innovation-driven and accountable institutions.

All study groups shall notify Study Group 3 at the earliest opportunity of any development that may have an impact on tariff and accounting principles and international telecommunication/ICT economic and policy issues.

ITU-T Study Group 5

ITU-T Study Group 5 will develop Recommendations, supplements and other publications to:

• study the environmental performance of ICTs and digital technologies and their effects on climate change, biodiversity and other environmental impacts;

• accelerate climate-change adaptation and mitigation actions through the use of ICTs and other digital technologies;

• study the environmental aspects of ICTs and digital technologies, including issues related to electromagnetic fields (EMF), electromagnetic compatibility (EMC), energy feeding and efficiency, and resistibility;

• play an active role in reducing the volume of e-waste and facilitate its management, in order to enhance the transition to a circular economy;

• study lifecycle and rare-metal recycling approaches for ICT equipment to minimize the environmental and health impact of e-waste;

• achieve energy efficiency and sustainable clean energy use in ICTs and digital technologies, including, but not limited to, labelling, procurement practices, standardized power supplies/connectors, eco-rating schemes, etc.;

• build resilient and sustainable ICT infrastructures in urban and rural areas as well as in cities and communities;

• study the role of ICTs and digital technologies in climate-change adaptation and mitigation;

• reduce the volume of e-waste and its environmental impacts (including the environmental impact of counterfeit devices);

• study the transition to a circular economy and implementing circular actions in cities;

• study the role of ICTs and digital technologies to achieve net zero within the ICT sector and other sectors as well as in cities;

• develop methodologies for assessing the environmental impact of ICT and other digital technologies;

• develop standards and guidelines for using ICTs and other digital technologies in an eco-friendly way and enhancing rare-metal recycling and energy efficiency of ICT, including infrastructures/facilities

- develop standards, guidelines and metrics/key performance indicators (KPIs) for aligning the environmental performance of the ICT sector and digital technologies with the United Nations Sustainable Development Agenda 2030, the Paris Agreement and the Connect 2030 Agenda;

- develop energy efficiency/performance metrics/KPIs and related measurement methodologies for ICTs and digital technologies, including infrastructures and facilities;

- develop tools and guidance on proper, effective and simple communication to reach out to the general public on environmental issues, including EMF, EMC, resistibility, climate-change adaptation and mitigation, etc.;

- study of methodologies for assessing the environmental impact of ICT, in terms of both its own emissions and power usage and the savings created through ICT applications in other industry sectors;

- study of power-feeding methodologies that effectively reduce power consumption and resource usage, increase safety and increase global standardization for economic gains;

- set up a low-cost sustainable ICT infrastructure to connect the unconnected;

- study how to use ICTs to help countries and the ICT sector to adapt and build resilience to the effects of environmental challenges, including climate change;

- assess the sustainability impact of ICT to promote the Sustainable Development Goals (SDGs);

- study the protection of ICT networks and equipment from interference, lightning and power faults;

- develop standards related to the assessment of human exposure to EMF produced by ICT installations and devices;

- develop standards related to safety and implementation aspects related to ICT powering and to powering through networks and sites;

- develop standards related to components and application references for protection of ICT equipment and the telecommunication network;

- develop standards related to EMC, particle radiation effects, and assessment of human exposure to EMF produced by ICT installations and devices, including cellular phones, IoT devices and radio base stations;

- develop standards on the reutilization of the existing copper network outside plant and related indoor installations;

- develop standards to guarantee good reliability and low latency for high-speed network services by providing requirements on resistibility and EMC.

The meetings of Study Group 5 and its working parties/Questions should as far as practicable be collocated with other study groups/working parties/Questions involved in the study of environment, circular economy, energy efficiency and climate change to address the SDGs.

ITU-T Study Group 9

Within its general area of responsibility, ITU-T Study Group 9 will develop and maintain Recommendations on:

• audiovisual content systems for contribution and distribution, including broadcasting, over cable networks, e.g. coaxial cable, optical fibre or hybrid fibre coaxial (HFC), etc.;

• procedures for the operation of audiovisual content delivery over cable networks;

• the use of IP or other appropriate protocols, middleware and operating systems to provide time-critical services, services on demand or interactive services over cable networks;

• artificial intelligence (AI)-assisted delivery and transmission systems for audiovisual content and other data services over cable networks;

• cable network terminals and related interfaces (e.g. interfaces to home network devices, such as IoT devices, interfaces to the cloud);

• end-to-end integrated platforms for cable networks;

• advanced, interactive, time-critical and other services and applications over cable networks;

• cloud-based systems for audiovisual content services and control over cable networks;

• secured audiovisual content contribution and distribution, for example conditional access (CA) systems and digital rights management (DRM), over cable networks;

• accessibility applications to access audiovisual content over cable networks;

• common user profile and participation taxonomy for broadband cable-TV accessibility.

Study Group 9 will develop and maintain implementation guidelines to support the deployment of audiovisual content contribution and distribution in developing countries.

Study Group 9 is responsible for coordination with the ITU Radiocommunication Sector (ITU-R) on broadcasting matters.

Inter-Sector rapporteur group activities of different Sectors and/or joint rapporteur group activities of different study groups shall be seen as complying with the WTSA expectations for collaboration and coordination.

ITU-T Study Group 11

ITU-T Study Group 11 will develop Recommendations on the following subjects:

• network signalling and control architectures in existing and emerging telecommunication environments (e.g. software-defined networking (SDN), network function virtualization (NFV), future networks (FN), cloud computing, VoLTE/ViLTE, IMT-2020 network and beyond, quantum key distribution networks (QKDN) and related technologies, etc.);

• signalling requirements and protocols for services and applications;

• security of signalling protocols;

• session control and signalling requirements and protocols;

- resource control and signalling requirements and protocols;

- signalling and control requirements and protocols to support attachment in emerging telecommunication environments;

- signalling and control requirements and protocols to support broadband network gateways;

- signalling and control requirements and protocols to support emerging multimedia services;

- signalling and control requirements and protocols to support emergency telecommunication services (ETS);

- signalling requirements for establishing the interconnection of packet-based networks, including VoLTE/ViLTE-based networks, IMT-2020 and beyond;

- test methodologies and test suites as well as monitoring of parameters set for emerging network technologies and their applications, including cloud computing, SDN, NFV, IoT, VoLTE/ViLTE, IMT-2020 technologies, etc., to enhance interoperability;

- conformance, interoperability testing and network/system/service/device testing, including benchmark testing, a testing methodology and testing specification of standardized network parameters in relation to the framework for Internet-related performance measurement, etc.;

- combating counterfeiting of ICT devices;

- combating the use of stolen ICT devices.

Study Group 11 is to lend assistance to developing countries in the preparation of technical reports and guidelines on the deployment of packet-based networks as well as emerging networks.

The development of signalling requirements, protocols and test specifications will be as follows:

- Study and develop signalling requirements

- Develop protocols to meet the signalling requirements

- Develop protocols to meet the signalling requirements of new services and technologies

- Develop protocol profiles for the existing protocols

- Study existing protocols to determine if they meet the requirements, and work with the relevant standards-development organizations to avoid duplication and for necessary enhancements or extensions

- Study existing open-source codes from open-source communities (OSCs) to support the implementation of ITU-T Recommendations

- Develop signalling requirements and relevant test suites for interworking between new signalling protocols and existing ones

- Develop signalling requirements and relevant test suites for interconnection between packet-based networks (e.g. VoLTE/ViLTE-based networks, IMT-2020 and beyond)

- Develop test methodologies and test suites for the relevant signalling protocols.

Study Group 11 will collaborate with ITU-T Study Group 17 on security matters.

Study Group 11 is to work on enhancements to existing Recommendations on signalling protocols of legacy networks and new networks to ensure signalling security. The objective is to satisfy business needs of member organizations that wish to offer new features and services using networks based on existing Recommendations.

Study Group 11 is to continue coordination with the International Laboratory Accreditation Cooperation (ILAC) on the ITU Testing Laboratories recognition procedure and establishing collaboration with existing conformance assessment programmes.

Study Group 11 is to continue its work on any test specifications for use in benchmarks testing and testing specification for standardized network parameters in relation to the framework for Internet-related measurements.

Study Group 11 is to continue its work with relevant standards organizations and forums on subject areas established by the cooperation agreement.

Study Group 11 is to continue its work in developing ITU-T Recommendations, technical reports and guidelines to assist ITU Member States in combating counterfeiting, tampering and theft of ICT equipment and the adverse implications thereof.

ITU-T Study Group 12

A particular focus of ITU-T Study Group 12 is on the end-to-end quality (as perceived by the customer) delivered using a path that, with increasing frequency, involves complex interactions between terminals and network technologies (e.g. mobile terminals, multiplexers, gateway and network signal processing equipment, and IP-based networks).

As the lead study group for quality of service (QoS) and quality of experience (QoE), Study Group 12 coordinates QoS and QoE activities not only within ITU-T, but also with other standards-development organizations and forums, and develops frameworks to improve collaboration.

Study Group 12 is the parent group for the Quality of Service Development Group (QSDG); and the Regional Group of Study Group 12 on QoS for the Africa region (SG12RG-AFR).

Examples of the work Study Group 12 plans to undertake:

- end-to-end QoS planning, focusing on all-packet networks, but also considering hybrid IP/digital circuit-based paths;

- QoS operational aspects and related interworking guidance and resource management to support QoS;

- technology-specific (e.g. IP, Ethernet, multiprotocol label switching (MPLS)) performance guidance;

- application-specific (e.g. smart grid, Internet of Things (IoT), machine-to-machine (M2M), home network (HN), over-the-top (OTT)) performance guidance;

- definition of QoE requirements and performance targets, and associated evaluation methodologies, for multimedia services;

- definition of objective prediction models based on subjective assessment methodologies, data collection via crowdsourcing and customer surveys;

- definition of crowdsourcing-based methodologies for the assessment of QoS and QoE;

- subjective quality assessment methodologies for existing and emerging technologies (e.g. telepresence, virtual reality (VR) and augmented reality (AR));

- quality modelling (psychophysical models, parametric models, intrusive and non-intrusive methods, opinion models) for multimedia and speech (including wideband, superwideband and fullband);

- speech-based services in vehicles and aspects of mitigating driver distraction;

- speech terminal characteristics and electro-acoustic measurement methods (including wideband, superwideband and fullband);

- definition of QoS parameters and assessment methods related to artificial intelligence (AI) and machine learning;

- development of test specifications for ITU-T Recommendations on performance, QoS and QoE.

ITU-T Study Group 13

The key areas of competence of ITU-T Study Group 13 include:

- IMT-2020 and beyond network aspects: Studies on the requirements and capabilities for networks based on the service scenarios of IMT-2020 and beyond. This includes development of Recommendations on the framework and architecture design, including also network-related aspects of reliability, quality of service (QoS) and security. Furthermore, it includes interworking with current networks including IMT-Advanced, etc.

- Application of machine learning technology aspects for future networks: Studies on how to incorporate network intelligence into IMT-2020 and beyond. Development of Recommendations on overall requirements, functional architecture and application support capabilities for networks, which include artificial intelligence (AI) and machine learning mechanisms, based on, but not limited to, the gap analysis identified by the Focus Group on machine learning for future networks, including 5G.

- Software-defined networking (SDN), network slicing and orchestration aspects: Studies on SDN and data plane programmability to support functions such as network virtualization and network slicing necessary for exploding and diversifying services taking into account scalability, security and distribution of functions. Development of Recommendations on the orchestration and related management-control continuum capabilities/policies of network function components, softwarized network and network slices, including enhancement and support of distributed networking capabilities.

- Information-centric networking (ICN) and public packet telecom data network aspects: Studies related to analysis of ICN applicability to IMT-2020 and beyond. Development of new Recommendations on ICN general requirements, functional architecture and mechanisms of ICN networking and use-case specific mechanisms and architectures, including deployment of corresponding identifiers. Development of Recommendations on packet data network based on the study of requirements, frameworks and candidate mechanisms. Development of Recommendations on architecture, network virtualization, resource control and other technical issues of future packet-based network (FPBN), including migration from the conventional IP-based network to FPBN.

- Fixed, mobile and satellite convergence aspects: Studies related to access-agnostic core, which integrates fixed, mobile and satellite, and the application of innovative technologies to enhance such convergence, such as AI/machine learning., etc. This also includes the development of Recommendations on full connectivity for various types of user equipment.

- Knowledge-centric trustworthy networking and services aspects: Studies related to requirements and functions to support the building of trusted ICT infrastructures. Development of Recommendations regarding environmental and socio-economic awareness in order to minimize the environmental impact of future networks, as well as to reduce the barriers to entry for various actors involved in the network ecosystem.

- Quantum-enhanced networks: Studies related to quantum key distribution networks (QKDN). Furthermore, development of new Recommendations related to user networks interacting with quantum-enhanced networks.

- Aspects related to future computing, including cloud computing and data handling in telecommunication networks: Studies of the requirements, functional architectures and their capabilities, mechanisms and deployment models of future computing, including cloud computing and data handling, covering inter- and intra-cloud scenarios as well as the applications of future computing in vertical domains. Studies include the development of technologies from the network side to support end-to-end awareness, control and management of future computing, including cloud, cloud security and data handling.

Study Group 13 activities will also cover regulatory implications, including deep packet inspection, and lower energy consumption networks. Furthermore, it includes activities related to innovative service scenarios, deployment models and migration issues based on future networks.

In order to assist countries with economies in transition, developing countries and especially the least developed countries in the application of networks of the future, including IMT-2020 and beyond and other innovative technologies, Study Group 13 maintains a dedicated Question on this topic, and its regional group for Africa. Consultations should thereby be enabled with representatives of the ITU Telecommunication Development Sector (ITU-D) with a view to identifying how this assistance might best be provided through an appropriate activity conducted in conjunction with ITU-D.

Joint rapporteur group activities of different study groups shall be seen as complying with the WTSA expectations for collocation.

ITU-T Study Group 15

ITU-T Study Group 15 is the focal point in ITU-T for the development of standards on networks, technologies and infrastructures for transport, access and home. This encompasses the development of related standards for the customer premises, access, metropolitan and long-haul sections of communication networks.

Particular emphasis is given to providing global standards for a high-capacity (terabit) optical transport network (OTN) infrastructure, and for high-speed (multi-Mbit/s and Gbit/s) network access and home networking. This includes the related work on modelling for network, system and equipment management, transport network architectures and layer interworking. Special consideration is being given to the changing telecommunication environment, for example, supporting the evolving needs of mobile communication networks.

Access network technologies addressed by the study group include passive optical network (PON), point-to-point optical, and copper-based digital subscriber line (DSL) technologies, including ADSL, VDSL, HDSL, SHDSL, G.fast and MGfast. These access technologies find application in their traditional uses as well as in backhaul and fronthaul networks for emerging services such as broadband wireless and data centre interconnect. Home networking technologies include wired broadband, wired narrowband, wireless narrowband, optical fibre and free-space optical communications. Both access and home networking for smart-grid applications are supported.

Network, system and equipment features covered include: routing, switching, interfaces, multiplexers; secure transport; network synchronization (including frequency, time and phase); cross-connect (including optical cross-connect (OXC)), add/drop multiplexers (including fixed or reconfigurable optical add/drop multiplexers (ROADM)), amplifiers, transceivers, repeaters, regenerators; multilayer network protection switching and restoration; operations, administration and maintenance (OAM); transport resource management and control capabilities to enable increased transport network agility, resource optimization, and scalability (e.g. the application of software-defined networking (SDN) to transport networks, together with enabling the use of artificial intelligence (AI)/machine learning (ML) to support the automation of transport network operations). Many of these topics are addressed for various media and transport technologies, such as metallic and terrestrial/submarine optical fibre cables, dense and coarse wavelength-division multiplexing (DWDM and CWDM) optical systems for fixed and flex-grid networks, optical transport network (OTN), including the evolution of OTN beyond 400 Gbit/s rates, Ethernet and other packet-based data services.

The study group will handle the entire range of fibre and cable performance (including test methods), field deployment and installation, taking into account the need for additional specifications driven by new optical fibre technologies and new applications. The activity on field deployment and installation will address reliability, security aspects and social issues, such as the reduction of excavation, the problems caused to traffic and the generation of construction noise, and will include the investigation and standardization of new techniques allowing faster, cost-effective and safer cable installation. Planning, construction, maintenance and management of the physical infrastructure will take into account the advantages of emerging technologies. Approaches that improve network resilience and recovery from disasters will be studied.

In its work, Study Group 15 will take into account related activities in other ITU study groups, standards-development organizations, forums and consortia, and will collaborate with them to avoid duplication of effort and identify any gaps in the development of global standards.

Study Group 15 has developed standards on networks, technologies and infrastructures for transport, access and home related to Action Line C2 (Information and communication infrastructure) of the World Summit on the Information Society (WSIS) and United Nations Sustainable Development Goal 9 (Industry, innovation and infrastructure).

ITU-T Study Group 16

ITU-T Study Group 16 will work on the following items:

- terminology for various multimedia services;

- operation of multimedia systems and applications, including interoperability, scalability and interworking over different networks;

- ubiquitous multimedia services and applications;

- multimedia aspects of digital services;

- multimedia system and service accessibility for digital inclusion;

- development of multimedia end-to-end architectures, including vehicle gateway for intelligent transport systems (ITS);

- high-layer protocols and middleware for multimedia systems and applications, including IP-based television services (managed and non-managed networks), Internet-based streaming media services and digital signage;

- media and signal coding;

- multimedia and multimode terminals;

- human-machine interaction;

- signal processing network equipment and terminals, gateway implementations, and characteristics;

- quality of service (QoS), quality of experience (QoE) and end-to-end performance in multimedia systems;

- security of multimedia systems and services;

- multimedia aspects of distributed ledger technology (DLT) and its applications;

- digital multimedia services and applications in various vertical industries;

- AI-enabled multimedia applications.

In developing its studies, Study Group 16 will take into consideration societal and ethical aspects of intelligent applications.

ITU-T Study Group 16 will work collaboratively with all stakeholders working in the standardization areas within its mandate, in particular with ITU-T Study Groups 2, 9, 12 and 20 and other ITU study groups, other United Nations agencies, the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), industry forums and consortia, and regional and international standards-development organizations.

ITU-T Study Group 17

ITU-T Study Group 17 is responsible for developing key technical Recommendations in supporting building confidence and security in the use of ICTs.

To this end, this includes studies relating to security, including cybersecurity, countering spam and identity management. It also includes security architecture and framework, security management, and security of networks, applications and services such as the Internet of Things (IoT), intelligent transport systems (ITS), secure application services, social networks, cloud computing, distributed ledger technology (DLT) and telebiometrics. Study Group 17 is also responsible for the application of open system communications, including directory and object identifiers, and for technical languages, the method for their usage and other issues related to the software aspects of telecommunication systems, and for conformance testing to improve the quality of Recommendations.

Study Group 17's role is to provide technical solutions for addressing security for ICTs and ensuring security by ICTs. Studies focus especially on security for new emerging areas, such as security for IMT-2020/5G and beyond, IoT, smart cities, DLT, big data analytics, ITS, security aspects related to artificial intelligence (AI) and quantum-related technologies. Its study areas also include the management of personally identifiable information (PII), such as technical and operational aspects of data protection with respect to ensuring confidentiality, integrity and availability of PII.

In the area of security, Study Group 17 is responsible for developing the core Recommendations on ICT security, such as security architecture and frameworks; the fundamentals related to cybersecurity, including threats, vulnerabilities and risks, incident handling/response and digital forensics; security management, including management of PII, such as technical and operational aspects of data protection; and countering spam by technical means.

Study Group 17 provides overall coordination of security work in ITU-T in its capacity as lead study group on security, on identity management, and on languages and description techniques.

In addition, Study Group 17 is responsible for developing the core Recommendations on security for DLT, security for ITS, security aspects of applications and services in the areas of Internet Protocol television (IPTV), various kinds of networks, including IMT-2020/5G and beyond, smart grid, industrial control systems (ICS), supply chains, IoT and smart cities, software-defined networking (SDN), network function virtualization (NFV), social networks, cloud computing, big data analytics, smartphones, digital financial systems and telebiometrics.

Study Group 17 is also responsible for developing the core Recommendations on a generic identity management model that is independent of network technologies and supports the secure exchange of identity information between entities. This work also includes studying the process for discovery of authoritative sources of identity information; generic mechanisms for the bridging/interoperability of a diverse set of identity information formats; identity management threats; the mechanisms to counter these threats; the protection of PII; and the development of mechanisms to ensure that access to PII is only authorized when appropriate.

In the area of open system communication, Study Group 17 is responsible for Recommendations in the following areas:

- directory services and systems, including public key infrastructure (PKI) (ITU-T F.500- and ITU-T X.500-series);

- object identifiers (OIDs) and associated registration authorities (ITU-T X.660/ITU-T X.670-series);

- open systems interconnection (OSI), including Abstract Syntax Notation One (ASN.1) (ITU-T F.400-, ITU-T X.200-, ITU-T X.400-, ITU-T X.600-, ITU-T X.800-series); and

- open distributed processing (ODP) (ITU-T X.900-series).

In the area of languages, Study Group 17 is responsible for studies on modelling, specification and description techniques, which includes languages such as ASN.1, SDL, MSC, URN and TTCN-3.

Study Group 17 coordinates security work across all study groups in ITU-T. This work will be developed in line with the requirements of, and in cooperation with, the relevant study groups such as ITU-T Study Groups 2, 9, 11, 13, 15, 16 and 20.

Study Group 17 will work on relevant identity management aspects in collaboration with Study Group 20 and Study Group 2, as per the mandate of each study group.

ITU-T Study Group 20

ITU-T Study Group 20 will work on the following items:

- framework and roadmaps for the harmonized and coordinated development of Internet of things (IoT), including machine-to-machine (M2M) communications, ubiquitous sensor networks and smart sustainable cities, in ITU-T and in close cooperation with the ITU Radiocommunication Sector (ITU-R) and ITU Telecommunication Development Sector (ITU-D) study groups and other regional and international standards organizations and industry forums;

- requirements and capabilities for IoT and smart cities and communities (SC&C) including verticals;

- definitions and terminology for IoT and SC&C;

- solutions provided by emerging digital technologies and their technical impact on IoT and SC&C;

- IoT and SC&C network infrastructure, connectivity and devices and digital services and applications, including architectures and architecture frameworks for IoT and SC&C;

- evaluation, assessment, service analysis and infrastructure for SC&C for the use of emerging digital technologies in the smartness of cities;

- guidelines, methodologies and best practices related to standards to help cities, communities, rural areas and villages deliver services using emerging digital technologies;

- identification aspects of IoT and SC&C in collaboration with other study groups, as appropriate;

- protocols and interfaces for IoT and SC&C systems, services and applications;

- platforms for IoT and SC&C;

- interoperability and interworking of IoT and SC&C systems, services and applications;

- quality of service (QoS) and end-to-end performance for IoT and SC&C, in collaboration with Study Group 12, as appropriate;

- security, privacy[4] and trustworthiness[4] of IoT and SC&C systems, services and applications;

- database maintenance of IoT and SC&C standards;

- big data aspects, including big data ecosystems, of IoT and SC&C;

- digital and smart services for SC&C;

- IoT and SC&C data processing and management, including data analytics, and AI-enabled applications;

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[4] Some relevant aspects of this term may be considered differently from one Member State to another. The use of this term is framed in terms of international telecommunication standardization.

- technical aspects of data value chain for IoT and SC&C, in collaboration with Study Group 3, as appropriate;

- datasets and semantics-based capabilities for IoT and SC&C including verticals.

ANNEX C
(to Resolution 2 (Rev. Geneva, 2022))

List of Recommendations under the responsibility of the respective ITU-T study groups and TSAG in the 2022-2024 study period

ITU-T Study Group 2

ITU-T E-series, except those in conjunction with Study Group 17 or under the responsibility of Study Groups 3, 12 and 16

ITU-T F-series, except those under the responsibility of Study Groups 13, 16 and 17

Recommendations of the ITU-T I.220-, ITU-T I.230-, ITU-T I.240-, ITU-T I.250-series and ITU-T I.750-series

ITU-T G.850-series

ITU-T M-series

ITU-T O.220-series

ITU-T Q.513, ITU-T Q.800 – ITU-T Q.849, ITU-T Q.940-series

Maintenance of the ITU-T S-series

ITU-T V.51/M.729

ITU-T X.160-, ITU-T X.170-, ITU-T X.700-series

ITU-T Z.300-series

ITU-T Study Group 3

ITU-T D-series

ITU-T D.103/E.231

ITU-T D.104/E.232

ITU-T D.1140/X.1261

ITU-T Study Group 5

ITU-T K-series

ITU-T L.1 – ITU-T L.9, ITU-T L.18 – ITU-T L.24, ITU-T L.32, ITU-T L.33, ITU-T L.71, ITU-T L.75, ITU-T L.76, ITU-T L.1000-series

ITU-T Study Group 9

ITU-T J-series, except those under the responsibility of Study Groups 12 and 15

ITU-T N-series

ITU-T Study Group 11

ITU-T Q-series, except those under the responsibility of Study Groups 2, 13, 15, 16 and 20

Maintenance of the ITU-T U-series

ITU-T X.290-series (except ITU-T X.292) and ITU-T X.600 – ITU-T X.609

ITU-T Z.500-series

ITU-T Study Group 12

ITU-T E.420 – ITU-T E.479, ITU-T E.800 – ITU-T E.859

ITU-T G.100-series, except ITU-T G.160- and ITU-T G.180-series

ITU-T G.1000-series

ITU-T I.350-series (including ITU-T G.820/I.351/Y.1501), ITU-T I.371, ITU-T I.378, ITU-T I.381

ITU-T J.140-, ITU-T J.240- and ITU-T J.340-series

ITU-T P-series

ITU-T Y.1220-, ITU-T Y.1530-, ITU-T Y.1540-, ITU-T Y.1550- and ITU-T Y.1560-series

ITU-T Study Group 13

ITU-T F.600-series

ITU-T G.801, ITU-T G.802, ITU-T G.860-series

ITU-T I-series, except those under the responsibility of Study Groups 2, 12 and 15, and those having double/triple numbering in other series

ITU-T Q.933, ITU-T Q.933*bis*, ITU-T Q.10xx-series and ITU-T Q.1700-series

ITU-T X.1 – ITU-T X.25, ITU-T X.28 – ITU-T X.49, ITU-T X.60 – ITU-T X.84, ITU-T X.90 – ITU-T X.159, ITU-T X.180 – ITU-T X.199, ITU-T X.272, ITU-T X.300-series

ITU-T Y-series, except those under the responsibility of Study Groups 12, 15, 16 and 20

ITU-T Study Group 15

ITU-T G-series, except those under the responsibility of Study Groups 2, 12, 13 and 16

ITU-T I.326, ITU-T I.414, ITU-T I.430-series, ITU-T I.600-series and ITU-T I.700-series, except ITU-T I.750-series

ITU-T J.190 and ITU-T J.192

ITU-T L-series, except those under the responsibility of Study Group 5

ITU-T O-series (including ITU-T O.41/ITU-T P.53), except those under the responsibility of Study Group 2

ITU-T Q.49/O.22 and ITU-T Q.500-series, except ITU-T Q.513

Maintenance of the ITU-T R-series

ITU-T X.50-series, ITU-T X.85/ Y.1321, ITU-T X.86/ Y.1323, ITU-T X.87/Y.1324

ITU-T V.38, ITU-T V.55/ O.71, ITU-T V.300

ITU-T Y.1300 – ITU-T Y.1309, ITU-T Y.1320 – ITU-T Y.1399, ITU-T Y.1501 and ITU-T Y.1700-series

ITU-T Study Group 16

ITU-T E.120 – ITU-T E.139 (except ITU-T E.129), ITU-T E.161, ITU-T E.180-series, ITU-T E.330-series, ITU-T E.340-series

ITU-T F.700-series, except those under the responsibility of Study Group 20, and ITU-T F.900-series

ITU-T G.160-series, ITU-T G.710 – ITU-T G.729 (except ITU-T G.712), ITU-T G.760-series (including ITU-T G.769/Y.1242), ITU-T G.776.1, ITU-T G.799.1/ Y.1451.1, ITU-T G.799.2, ITU-T G.799.3

ITU-T H-series, except those under the responsibility of Study Group 20

ITU-T T-series

ITU-T Q.50-series, ITU-T Q.115-series

ITU-T V-series, except those under the responsibility of Study Groups 2 and 15

ITU-T X.26/V.10 and ITU-T X.27/V.11

ITU-T Study Group 17

ITU-T E.104, ITU-T E.115, ITU-T E.409 (in conjunction with Study Group 2)

ITU-T F.400-series; ITU-T F.500 – ITU-T F.549

ITU-T X-series, except those under the responsibility of Study Groups 2, 3, 11, 13, 15 and 16

ITU-T Z-series, except ITU-T Z.300-series and ITU-T Z.500-series

ITU-T Study Group 20

ITU-T F.744, ITU-T F.747.1 – ITU-T F.747.8, ITU-T F.748.0 – ITU-T F.748.5 and ITU-T F.771

ITU-T H.621, ITU-T H.623, ITU-T H.641, ITU-T H.642.1, ITU-T H.642.2 and ITU-T H.642.3

ITU-T L.1600, ITU-T L.1601, ITU-T L.1602, ITU-T L.1603

ITU-T Q.3052

ITU-T Y.4000-series, ITU-T Y.2016, ITU-T Y.2026, ITU-T Y.2060 – ITU-T Y.2070, ITU-T Y.2074 – ITU-T Y.2078, ITU-T Y.2213, ITU-T Y.2221, ITU-T Y.2238, ITU-T Y.2281 and ITU-T Y.2291

NOTE – Recommendations transferred from other study groups have double numbers in the Y.4000-series.

TSAG

ITU-T A-series Recommendations