بنام خداوند بخشنده و مهربان
ITU-T & Study Group 15

cمیه و ارائه: علیرضا ربعی
کارشناس نظارت و کنترل
اداره کل کنترل و هماهنگی مدیریت
شبکه و مهندسی عملیات سوئیچ
ITU-T SG15

- ITU-T in brief
- The Framework of ITU-T
- ITU-T Study Group,s
- Standard Development
- Standard Approval
- ITU and TSB Documentation
- Study Group 15
ITU-T SG15

- ITU-T in Brief:
  The **Study Groups** of ITU’s Telecommunication Standardization Sector (ITU-T) assemble experts from around the world to develop international standards known as **ITU-T Recommendations** which act as defining elements in the global infrastructure of information and communication technologies (ICTs). Standards are critical to the interoperability of ICTs and whether we exchange voice, video or data messages, standards enable global communications by ensuring that countries’ ICT networks and devices are speaking the same language.
From its inception in 1865, ITU-T has driven a contribution-led, consensus-based approach to standards development in which all countries and companies, no matter how large or small, are afforded equal rights to influence the development of ITU-T Recommendations. From its beginnings as a body standardizing international telegraph exchange, through its formative role in telecommunications, and in today’s converged ICT ecosystem, ITU-T has provided the world’s best facilities to the global standardization community and remains the world’s only truly global ICT standards body.
Based at ITU’s headquarters in Geneva, the Telecommunication Standardization Bureau (TSB) provides secretariat support to ITU-T Study Groups through sophisticated electronic working methods and state-of-the-art facilities in Geneva accommodating the six official languages of the Union – Arabic, Chinese, English, French, Russian and Spanish. Headed by an elected official with the title Director, it is the body responsible for providing cohesion to ITU-T’s standards development process.
ITU-T SG15

- The Framework of ITU:

- **World Telecommunication Standardization Assembly**

  The [World Telecommunication Standardization Assembly (WTSA)](WTSA) sets the overall direction and structure for ITU-T. It meets every four years and defines the general policy for the Sector, establishes the study groups, approves their expected work programme for the next four-year period, and appoints their chairmen and vice-chairmen.
ITU-T SG15

- **Telecommunication Standardization Advisory Group**

The [Telecommunication Standardization Advisory Group (TSAG)](https://www.itu.int/en/ITU-T/sg15) provides ITU-T with flexibility between WTSAs by reviewing priorities, programmes, operations, financial matters and strategies for the Sector. It also follows up on the accomplishments of the work programme, restructures and establishes ITU-T study groups, provides guidelines to the study groups, advises the Director of the Telecommunication Standardization Bureau (TSB), and produces organization and working procedures in the shape of A series Recommendations.
ITU-T SG15

• **Study Groups**
  The work of the Study Groups is at the heart of ITU-T.

  **Workshops and Seminars**
  ITU-T organizes a number of workshops and seminars to progress existing work areas and explore new ones. The events cover a wide array of topics in the ICT field and speakers and attendees include engineering, strategy and policy experts from a range of industry sectors. Organized events are free of charge and open to the public.
ITU-T SG15

- Technology Watch

  Technology Watch identifies and surveys emerging technologies, as well as their likely impact on future standardization work for both developed and developing countries, with a view to identifying work items able to lead to new ITU-T Recommendations.
ITU-T SG15

- ITU-T Study Group(s)
- Standardization work is carried out by the technical Study Groups (SGs) in which representatives of the ITU-T membership develop Recommendations (standards) for the various fields of international telecommunications.
ITU-T SG15

- **SG2** - Operational aspects
- **SG3** - Economic and policy issues
- **SG5** - Environment and climate change
- **SG9** - Broadband cable and TV
- **SG11** - Protocols and test specifications

- **SG12** - Performance, QoS and QoE
- **SG13** - Future networks (& cloud)
- **SG15** - Transport, Access and Home
- **SG16** - Multimedia
- **SG17** - Security
ITU-T SG15

- Standard Development and Approval:
- ITU-T offers a unique contribution-driven and consensus-based environment, using the latest collaboration tools and facilities.

Contribution is the term used to describe membership input into a Study Group. This input can be on any relevant topic but is typically limited to suggesting new work areas, draft Recommendations, changes to existing Recommendations.
ITU-T SG15

Study Groups drive their work primarily in the form of study Questions. Each of these addresses technical studies in a particular area of telecommunication standardization. Each SG has a Chairman and a number of vice-chairmen appointed by the World Telecommunication Standardization Assembly (WTSA).
ITU-T SG15

- To assist in the organization of the work, the SG may be organized into a number of working parties. The working party is the next organizational unit down within the study group (SG). It coordinates a number of study Questions on a related theme, e.g. the Media Coding Working Party in Study Group 16 deals with all study Questions relating to coding of speech, audio and video streams that we use every day for Internet calls, DVDs, etc.
The team of experts working on a specific Question is known as the rapporteur group. Their meetings are chaired by the relevant rapporteur. Considering the text of the Question and guidance from the SG, the participants determine what Recommendations are required and develop text for these Recommendations taking all relevant inputs into account and consulting other relevant parts of ITU-T. During a meeting of the parent WP or SG, the experts will normally meet to progress the work, but they may also meet independently of the parent WP or SG, in a more informal setting, when required.
ITU-T SG15

• A Question is the basic project unit within ITU-T. The area of study of the project is defined by the text of the Question, and this is generally approved by the study group itself. For a new Question to be established, it is necessary that a number of Members commit to support the work. Questions address technical studies in a particular area of telecommunication standardization, and are driven by contributions. A Question is normally terminated once the defined work has been completed, or the task is revised in the light of developments, which can be technical, market-oriented, network or service driven. The text for each of the Questions assigned to a study group can be found on its web page.
1. Organization X becomes a member of ITU-T and identifies an ICT issue in need of standardization.

2. X submits the suggested research item to the relevant ITU-T Study Group

3. Study Group approves the idea as study Question and allocates the work to a Working Party (WP).

4. The WP assigned to work on X's Question starts work on the development of a new ITU-T Rec.

5. The draft Rec is submitted to an SG/WP meeting and if considered mature it is given Consent to move forward into the Alternative Approval Procedure (AAP).
The “Alternative Approval Process” (AAP) is a fast-track approval procedure that was developed to allow standards to be brought to market in the timeframe that industry now demands.

This dramatic overhaul of standards-making by streamlining approval procedures was implemented in 2001 and is estimated to have cut the time involved in this critical aspect of the standardization process by 80 to 90 per cent. This means that an average standard which took around four years to approve and publish until the mid nineties, and two years until 1997, can now be approved in an average of two months, or as little as five weeks.
ITU-T SG15

- Only those that have regulatory implications are not, they use the what is called the traditional approval process (TAP). Besides streamlining the underlying procedures involved in the approval process, an important contributory factor to the use of AAP is electronic document handling. Once the approval process has begun the rest of the process can be completed electronically, in the vast majority of cases, with no further physical meetings. The introduction of AAP also formalizes public/private partnership in the approval process by providing equal opportunities for both Sector Members and Member States in the approval of technical standards.
Once the text of a draft Recommendation prepared by Study Group (SG) experts is considered mature, it is submitted for review to a SG or Working Party (WP) meeting. If agreed by the meeting it is given Consent. This means that the SG or WP has given its consent that the text is sufficiently mature to initiate a final review process leading to approval of the draft Recommendation. After this Consent has been achieved, the Director of ITU-T's secretariat, the Telecommunication Standardization Bureau (TSB), announces the start of the AAP procedure by posting the draft text to the ITU-T web site and calling for comments. This gives the opportunity for all members to review the text.
This phase, called Last Call, is a four-week period in which comments can be submitted by Member States and Sector Members. If no comments other than editorial corrections are received, the Recommendation is considered approved since no issues were identified that might need any further work. However, if there are any comments, the SG chairman, in consultation with TSB, sets up a comment resolution process by the concerned experts. The revised text is then posted on the web for an Additional Review period of three weeks.
ITU-T SG15

- Similar to the Last Call phase, in Additional Review the Recommendation is considered as approved if no comments are received. If comments are received, it is apparent that there are some issues that still need more work, and the draft text and all comments are sent to the next Study Group meeting for further discussion and possible approval.
ITU-T SG15

- After a Last Call in which comments were received, if the SG Chairman sees that there is insufficient time for comment resolution and an Additional Review period, the draft Recommendation and unresolved comments can be sent directly to the next meeting of the SG for resolution and agreement.
ITU-T SG15

- ITU-T and TSB Documentation:
  - TSB Circulars
  - TSB Collective-Letters
  - Meeting Documents
  - Contributions
  - Reports
  - Temporary Documents
  - Liaison Statements
ITU-T SG15

- TSB Circulars
  These letters are addressed to all the participants in the work of the Sector and contain information of general interest such as the meeting schedule, work procedures, the list of hotels, etc. Study groups diffuse Circulars in order to implement the provisions of WTSA regarding the approval and deletion of recommendations or to distribute questionnaires. TSB Circulars are posted on the ITU-T Website and do not have restricted access.
TSB Collective-letters
These letters issue from study groups and are addressed to the participants which have registered to receive the documents of the study group concerned. Collective-letters are used to convene meetings or collect information of interest to the study group. Collective-letters are posted on the relevant study group page on the ITU-T Website and do not have restricted access.
The following meeting documents are posted on the appropriate study groups' pages.

- Contributions
  The participants of the Sector submit their input to meetings by means of a Contribution. Contributions submitted to the TSB at least two months before a meeting are published and dispatched to the participants of the Sector registered in the relevant study group. A TIES (Telecommunication Information Exchange Service) account is required to access these documents.
ITU-T SG15

• **Reports**
  Meeting reports are published after a meeting, dispatched to the participants of the Sector registered in the relevant study group. A TIES account is required to access these documents.

• **Temporary Documents**
  Temporary documents contain reports from Chairmen, Rapporteurs, Drafting Groups, and other groups or other relevant information to be submitted to a meeting. These are distributed only to the participants present. A TIES account is required to access these documents.
ITU-T SG15

- Liaison Statements
  Liaisons Statements are used to transmit information from one group to another. These are distributed only to the participants present and are posted in the informal FTP area of the relevant study groups as Incoming and Outgoing Liaison Statements. A TIES account and registration to the relevant study group informal FTP area are required to access these documents.
ITU-T SG15

- Study Group 15:

- ITU-T Study Group 15 - Networks, Technologies and Infrastructures for Transport, Access and Home
ITU-T SG15

- DWDM
- CWDM
- OTN
- OTS
- ASON
- Optical Fibre and Cables
- Optical Fibre Structure
- G-PON
- XG-PON
- DSL
- SYNC. Over Packet Network
The international standards (ITU-T Recommendations) produced by Study Group 15 detail technical specifications giving shape to global communication infrastructure. The group’s standards define technologies and architectures of optical transport networks enabling long-haul global information exchange; fibre- or copper-based access networks through which subscribers connect; and home networks connecting in-premises devices and interfacing with the outside world.
Transport:
The Optical Transport Network (OTN), which provides a terabit-capable framework equipped to carry ever-rising volumes of data and video traffic, is rapidly supplanting its predecessor, Synchronous Digital Hierarchy (SDH), which has been the dominant transport protocol for the previous 20 years. OTN’s support for both optical (wavelength division or WDM) and digital multiplexing techniques improves network efficiency
The WDM aspects of OTN increase the traffic-carrying capacity of optical fibres by allowing simultaneous operation over multiple wavelengths. The digital hierarchy and mappings provide transport of new packet, data-centre and video protocols (for example, IP/MPLS, Ethernet, Fibre Channel, SDI, DVB_ASI), in addition to legacy protocols (such as SDH) which allows for the seamless convergence of operators’ networks. OTN also offers the flexibility required to support future protocols as they emerge.
Additionally, the Automatically Switched Optical Network (ASON) provides quick and reliable configuration of connections across the transport network. ASON gives operators a way to manage network traffic more dynamically than traditional connection management techniques. This enhanced capability allows, for example, the rerouting traffic away from points of failure to provide highly reliable connections.
ITU-T SG15

Access:

SG15 produces the digital subscriber line (DSL) standards that provide broadband Internet connections to over 600 million households around the world. The group continues to challenge the existence of a ceiling to network capacity in the predominantly copper “last mile” (between the exchange and the customer premises). VDSL2 vectoring achieves access speeds of 250 Mbit/s, and the next update of DSL (G.fast) will raise the bar to 1 Gbit/s by combining the best aspects of optical networks and DSL.
ITU-T SG15

- SG15 also standardizes shared-access fibre-to-the-home (FTTH) technologies known as passive optical networks (PONs). PONs are a crucial step towards all-optical networks and, by eliminating the dependence on expensive active network elements, PONs enable carriers to make significant savings. 10-Gigabit-capable PON (XG-PON) is ITU-T’s latest series of PON standards and achieves access speeds of up to 10 Gbit/s.
ITU-T SG15

- Smart grid and Home Networking:
- SG15’s experience in optimizing the communication capabilities of wired infrastructure makes it the natural home of ITU’s work on Smart Grid. SG15 has produced a family of orthogonal frequency-division multiplexing (OFDM)-based narrowband powerline communication (NB-PLC) standards that reuse the electric grid as a telecommunication medium, primarily to monitor, analyse and control power supply/usage. This work builds on G.hn (ITU-T G.996x-series) which provides broadband home-networking over telephone wiring, coaxial cable and power-line wiring.
Questions:

Q1/15 Coordination of access and Home Network Transport standards
Q2/15 Optical systems for fibre access networks
Q3/15 General characteristics of transport networks
Q4/15 Broadband access over metallic conductors
Q5/15 Characteristics and test methods of optical fibres and cables
ITU-T SG15

- **Q6/15**
  Characteristics of optical systems for terrestrial transport networks
- **Q7/15**
  Characteristics of optical components and subsystems
- **Q8/15**
  Characteristics of optical fibre submarine cable systems
- **Q9/15**
  Transport network protection/restoration
- **Q10/15**
  Interfaces, Interworking, OAM and Equipment specifications for Packet based Transport Networks
ITU-T SG15

- **Q11/15**
  - Signal structures, interfaces, equipment functions, and interworking for transport networks
- **Q12/15**
  - Transport network architectures
- **Q13/15**
  - Network synchronization and time distribution performance
- **Q14/15**
  - Management and control of transport systems and equipment
- **Q15/15**
  - Communications for Smart Grid
ITU-T SG15

- **Q16/15**
  - Outside plant and related indoor installation
- **Q17/15**
  - Maintenance and operation of optical fibre cable networks
- **Q18/15**
  - Broadband in-premises networking
ITU-T SG15

- WP and Questions:
  - WP1/15
    Transport aspects of access, home and smart grid networks
  - Q1/15
    Coordination of access and Home Network Transport standards
  - Q2/15
    Optical systems for fibre access networks
  - Q4/15
    Broadband access over metallic conductors
  - Q15/15
    Communications for Smart Grid
  - Q18/15
    Broadband in-premises networking
ITU-T SG15

- **WP2/15**
  Optical technologies and physical infrastructures
- **Q5/15**
  Characteristics and test methods of optical fibres and cables
- **Q6/15**
  Characteristics of optical systems for terrestrial transport networks
- **Q7/15**
  Characteristics of optical components and subsystems
- **Q8/15**
  Characteristics of optical fibre submarine cable systems
- **Q16/15**
  Outside plant and related indoor installation
- **Q17/15**
  Maintenance and operation of optical fibre cable networks
ITU-T SG15

- **WP3/15**
- **Transport network characteristics**
  - **Q3/15**
    - General characteristics of transport networks
  - **Q9/15**
    - Transport network protection/restoration
  - **Q10/15**
    - Interfaces, Interworking, OAM and Equipment specifications for Packet based Transport Networks
  - **Q11/15**
    - Signal structures, interfaces, equipment functions, and interworking for transport networks
  - **Q12/15**
    - Transport network architectures
  - **Q13/15**
    - Network synchronization and time distribution performance
  - **Q14/15**
    - Management and control of transport systems and equipment
ITU-T SG15

- ITU-T Recommendations under Study Group 15 responsibility

SG15 Recommendations:
- G series: Transmission systems and media, digital systems and networks
- I series: Integrated services digital network
- L series: Construction, installation and protection of cables and other elements of outside plant
- O series: Specifications of measuring equipment
ITU-T SG15

- **P series**: Terminals and subjective and objective assessment methods
- **Q series**: Switching and signalling
- **R series**: Telegraph transmission
- **V series**: Data communication over the telephone network
- **X series**: Data networks, open system communications and security
- **Y series**: Global information infrastructure, Internet protocol aspects and next-generation networks
ITU-T SG15

- SG15 Chairman and Vicechairman,s:
  - Stephen J. TROWBRIDGE
    SG15 Chairman
  - Alcatel-Lucent
    5280 Centennial Trail Boulder, Colorado
    80303-1262 United States
    Tel: +1 972 477 8172
    E-mail: Steve.Trowbridge@alcatel-lucent.com
ITU-T SG15

- **Ghani ABBAS**  
  SG15 Vice-chairman  
  Ericsson  
  United Kingdom  
  E-mail: ghani.abbas@ericsson.com

- **Fahad ALFALLAJ**  
  SG15 Vice-chairman  
  Communications and Information Technology Commission  
  P.O. Box 61762 Riyadh 11575 Saudi Arabia  
  Tel: +966 1 4618160  
  Fax: +966 1 4618341  
  E-mail: ffallaj@citc.gov.sa

- **Noriyuki ARAKI**  
  SG15 Vice-chairman  
  NTT  
  1-7-1, Hanabatake, Tsukuba Ibaraki 305-0805 Japan  
  Tel: +81 29 868 6365  
  Fax: + 81 29 868 6360  
  E-mail: araki.noriyuki@lab.ntt.co.jp
ITU-T SG15

- Viktor KATOK
  SG15 Vice-chairman
  SPTU
  SPTU Ukraine 18 Tarasa Shevchenko Blvd Kiev 01030 Ukraine
  Tel: +380 44 230 9022
  Fax: +380 44 246 4422
  E-mail: vkatok@ukrtelecom.ua

- Dan LI
  SG15 Vice-chairman
  HUAWEI
  China
  Tel: +86 755 2897 3237
  Fax: +86 755 2897 2935
  E-mail: Huawei.danli@huawei.com

- Francesco MONTALTI
  SG15 Vice-chairman
  Tyco
  Belgium
  Tel: +39 335 7510652
  E-mail: francescomontalti53@gmail.com
ITU-T SG15

- **Atílio REGGIANI**
  SG15 Vice-chairman
  CPqD Telecom & IT Solutions
  Rod. Campinas - Mogi-Mirim km 118,5 13088-902 -CAMPINAS-SP Brazil
  Tel: +55 19 3705 6584
  Fax: +55 19 3705 6119
  E-mail: atilio@cpqd.com.br

- **Jeong-dong RYOO**
  SG15 Vice-chairman
  ETRI
  Korea (Rep. of)
  Tel: +82 42 860 5384
  E-mail: ryoo@etri.re.kr

- **Helmut SCHINK**
  SG15 Vice-chairman
  Nokia Solutions and Networks Gmbh & Co. KG
  81669 Muenchen, St. Martin Str. 53 Germany
  Tel: +49 89 636 79115
  E-mail: helmut.schink@nsn.com
ITU-T SG15

- WP's /SG15 Chairman and Vicechairman:
  - Tom STARR
    WP1/15 Chairman
  - AT&T room 3D10 2000 West AT&T Center Drive Hoffman Estates, Illinois 60192 United States
    Tel: +1 847 248 5467
    Fax: +1 847 248 8002
    E-mail: ts1452@att.com
  - Hubert MARIOTTE
    WP1/15 Vice-chairman
  - Orange
    2, avenue P. Marzin 22307 Lannion France
    Tel: +33296050536
    Fax: +33296053236
    E-mail: hubert.mariotte@orange.com
ITU-T SG15

- Francesco MONTALTI
  WP2/15 Chairman

- Tyco
  Belgium
  Tel: +39 335 7510652
  E-mail: francescomontalti53@gmail.com

- Viktor KATOK
  WP2/15 Vice-chairman

- SPTU
  SPTU Ukraine 18 Tarasa Shevchenko Blvd Kiev 01030 Ukraine
  Tel: +380 44 230 9022
  Fax: +380 44 246 4422
  E-mail: vkatok@ukrtelecom.ua
ITU-T-SG15

- Ghani ABBAS  
  WP3/15 Chairman
- Ericsson  
  United Kingdom  
  E-mail: ghani.abbas@ericsson.com
- Malcolm BETTS  
  WP3/15 Vice-chairman
- ZTE  
  China  
  Tel: +1 678 534-2542  
  E-mail: malcolm.betts@zte.com.cn
ITU-T SG15

- **Greg JONES**
  SG15 Counsellor
- **ITU**
  ITU/TSB Place des Nations 1211 Geneva 20 Switzerland
  Tel: +41 22 730 5515
  Fax: +41 22 730 5853
  E-mail: greg.jones@itu.int

- **Hiroshi OTA**
  SG15 Advisor
- **ITU**
  ITU/TSB Place des Nations 1211 Geneva 20 Switzerland
  Tel: +41 22 730 6356
  Fax: +41 22 730 5853
  E-mail: hiroshi.ota@itu.int
با سپاس از توجه همکاران گرامی

علي‌پژا ربعی
کارشناس نظامت و کنترل
اداره کل کنترل و هماهنگی مدیریت شبکه و مهندسی عملیات سوئیچ