

Standardization Bodies

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ITU

Content:

1. ITU
2. Work areas
3. Features
4. Sectors

ITU:

ITU stands for International Telecommunication Union

It was formed on 17 may 1865 in Paris at International Telegraph Convention

Its headquarter lies in Geneva, Switzerland.

It is a UN specialized agency who responsible for issues related to information and communication technologies.

ITU:

ITU work field include :

- Broadband Internet
- Latest-generation wireless technologies
- Aeronautical and maritime navigation
- Radio astronomy,
- Satellite-based meteorology,
- Convergence in fixed-mobile phone
- Internet access,
- Data, Voice, TV broadcasting
- Next-generation networks.

ITU:

ITU Features :

- Globalisation of radio spectrum
- Assign satellite orbits with international cooperation
- Improve telecommunication infrastructure in the developing world
- Develop and coordinate the worldwide technical standards

ITU:

ITU is a member of the United Nations Development Group

It has 12 regional and area offices in the world.

Its membership includes

- 193 Member States
- Approx 800 public and private sector companies
- Academic institutions
- International and regional telecommunication entities

ITU:

The ITU comprises three sectors:

1. Radio communication (ITU-R):

Established in 1927

Known as the International Radio Consultative Committee or CCIR

It manages the international radio-frequency spectrum and satellite orbit resources.

ITU:

The ITU comprises three sectors:

2. Standardization of Telecommunication area (ITU-T) :

Established in 1956

Known as the International Telephone and Telegraph Consultative Committee or CCITT

This sector standardizes global telecommunications (except for radio).

It is an essential building block for the operation of modern ICT networks.

ITU:

The ITU comprises three sectors:

3. Development of telecommunication area (ITU-D):

Established in 1992

this sector helps spread equitable, sustainable and affordable access to information and communication technologies (ICT).

ITU Telecom : ITU Telecom organizes major events for the world's ICT community.

ETSI

Content:

1. ETSI
2. Working Area
3. Members
4. Aim
5. SMP
6. ETSI Deliverable Types

ETSI:

ETSI stands for European Telecommunications Standards Institute, a non-profit organization.

It establishes telecommunications standards for Europe.

ETSI organization includes a general assembly, a board, a technical organization, and a secretariat.

ETSI is headquartered in southern France ,Sophia Antipolis.

ETSI produces global standards for ICT, including fixed, mobile, radio, converged, broadcast and internet technologies.

ETSI:

ETSI work areas :

- Aeronautical radio,
- API and ATM
- Electromagnetic compatibility
- Electronic signature
- Addressing and Transport protocol
- Telecommunications Management Network (TMN)
- TETRA, VoIP, and xDSL.

ETSI:

ETSI has 800 members from 64 countries and five continents.

Its membership list include

- IBM Europe
- Microsoft Europe
- Hewlett-Packard France
- Motorola
- Lucent Technologies.

Each member pays an annual fee to join ETSI.

ETSI:

One of the most significant tasks of ETSI - was to create the first GSM and UMTS standards.

Second important task of ETSI was - the acceptance of DVB-H (Digital Video Broadcasting, Hand-held).

Aim :

- To provide access to European markets.
- To produce high quality standards with low time-to-market

ETSI:

ETSI Standards Making Process (SMP):

SMP is used to identify a market need and develop a compatible standards and technology.

The participating members are:

- ETSI Technical Organization
- ETSI members
- ETSI National Standards Organizations.

The process is defined in the ETSI Directives.

ETSI:

ETSI Standards Making Process (SMP): work include

- Identifying needs for standardization
- Assigning a suitable technical committee
- Standardization of work flow
- identification and definition of work
- Approval and adoption of developed work items
- Drafting and editing of contents
- Lastly actual publication..

ETSI:

ETSI Deliverable Types:

- European Standard, telecommunications series (EN)
- ETSI Standard (ES)
- ETSI Guide (EG)
- ETSI Special Report (SR)
- ETSI Technical Specification (TS)
- ETSI Technical Report (TR)
- ETSI Group Specification (GS)

IMT-2020

Content:

1. IMT-2020
2. IMT 2020 standardization Process

IMT-2020:

IMT-2020 stands for International Mobile Communications -2020 standard.

It is developed by International Telecommunications Union (ITU) and its partners

They set a benchmark for all future mobile-broadband communications to provide international specification for 5G.

IMT-2020 is a term developed by the ITU Radiocommunication Sector in 2012

It develop the vision of “IMT for 2020 and beyond.”

IMT-2020:

IMT-2020 Standardization Process:

In year 2012 -2015

- Development Plan
- Market Need
- Technology development and Research begin
- Setting Vision of IMT for 2020
- Name and version Specification
- Process Optimization
- <6 GHz Spectrum View

IMT-2020:

IMT-2020 Standardization Process:

In year 2016 -2017

- Spectrum Band arrangement (WRC-15)
- Technical Performance Requirement
- Evaluation Process
- Invitation of Proposals
- Evaluating Study parameters (IMT WRC-19)

IMT-2020:

IMT-2020 Standardization Process:

In year 2018 -2019

- Proposal
- Evaluation
- Consensus Building
- CPM Report (IMT WRC-19)
- Sharing Study report

IMT-2020:

IMT-2020 Standardization Process:

In year 2019 -2020

- Spectrum Arrangement
- Decision and Radio Framework
- Detailed IMT-2020 Radio Specification
- Future enhancement
- Update Plan and Process

IMT-2020:

Important 5G performance requirements for IMT-2020

- Requirement for bandwidth at least 100 MHz
- Bandwidths up to 1 GHz are required for higher frequencies (above 6 GHz)
- Minimum requirement for connection density is 1 million devices per km²
- Downlink peak data rate of 20 Gb/s
- Uplink peak data rate of 10 Gb/s
- Target downlink “user experienced data rate” of 100 Mb/s
- Target uplink “user experienced data rate” of 50 Mb/s

IEEE

Content:

1. IEEE
2. IEEE Publication
3. IEEE Learning Opportunities
4. IEEE Technical Council
5. IEEE Membership Grades
6. IEEE 802

IEEE:

IEEE stands for Institute of Electrical and Electronics Engineers.

It is a professional association formed in 1963.

It is formed by combination of the American Institute of Electrical Engineers and the Institute of Radio Engineers.

Its objectives includes the educational and technical advancement of electrical and electronic engineering, telecommunications and computer engineering.

IEEE corporate office is in New York City and its operations center is in Piscataway, New Jersey.

IEEE:

IEEE Publication:

IEEE produces over 30% of the world's literature in the electrical and electronics engineering and computer science field.

It published well over 100 peer-reviewed journals.

IEEE published work is available on IEEE online digital library - IEEE Xplore.

It has a offer as subscription-based access and individual publication purchases.

IEEE:

IEEE Learning Opportunities :

- **IEEE eLearning Library:** It is a collection of online educational courses designed for self-paced learning.
- **Education Partners:** available only for IEEE members. It offers online degree programs, certifications and courses at a 10% discount.
- **The Standards in Education website:** explains what standards are and the importance of developing and using them.
- **Continuing Education Units (CEUs) :** is used to maintain Professional Engineering license to encourage engineers to seek their participation in continuing education programs.

IEEE:

IEEE Technical Councils :

There are seven technical councils:

1. IEEE Biometrics Council
2. IEEE Council on Electronic Design Automation
3. IEEE Nanotechnology Council
4. IEEE Sensors Council
5. IEEE Council on Superconductivity
6. IEEE Systems Council
7. IEEE Council on RFID (CRFID)

IEEE:

IEEE Membership grades :

1. Student Members
2. Graduate Student Members
3. Members
4. Societies Affiliates
5. Senior Members
6. Fellow Members
7. Honorary Members
8. Life Members, Life Senior Members and Life Fellow

IEEE:

One of the most important areas of IEEE standards is the series of IEEE 802.

1. IEEE 802: Overview & Architecture.
2. IEEE 802.1: Bridging & Management.
3. IEEE 802.2: Logical Link Control.
4. IEEE 802.3: Ethernet.
5. IEEE 802.11: Wireless LANs.
6. IEEE 802.15: Wireless PANs.
7. IEEE 802.21: Media Independent Handover Services
8. IEEE 802.22: Wireless Regional Area Networks

IETF & CEPT

Content:

1. IETF
2. IETF members
3. IETF working areas
4. IETF Standard Creation Process
5. CEPT

IETF:

IETF stands for Internet Engineering Task Force

It is an international and open community of network operators, vendors, designers, and researchers.

It develops and promotes Internet standards, that comprise the Internet protocol suite (TCP/IP).

The task of IETF is to be actively involved in the evolution of the Internet architecture and to assure the Internet is and will function smoothly.

The work of IETF is documented as recommendations as RFC n.

IETF:

IETF Members:

IETF is organized into working groups, each focusing to a certain technical area.

IETF also organizes meetings, but only three times per year.

The specific organization of IETF groups is based on Area Directors (AD). They are members of the Internet Engineering Steering Group (IESG).

The General AD chairs the IESG and IETF, and is an ex-officer member of the IAB (Internet Architecture Board) which in turn gives input about the architectural

IETF:

IETF working Area:

1. Automated Network Management
2. Internet of things
3. New transport technology
4. IETF areas
5. Token Binding Protocol

IETF:

IETF Standard Creation Process:

1. Review of specification by Internet Community
2. The specification has a development period during which it is reviewed
The experience of the reviewers plays a major role at this stage.
3. Sufficiently clear definition which is easy to understand.
4. After the reviews, the specification proposal is adopted as a Standard by the appropriate body.
5. After the adaptation, the standard is ready for publishing.

CEPT:

CEPT stands for European Conference of Postal and Telecommunications Administrations

It was established on June 26, 1959, as a coordinating body for European state telecommunications and postal organizations.

CEPT was responsible for the creation of the European Telecommunications Standards Institute (ETSI) in 1988.

CEPT has 48 member countries.

CEPT:

CEPT is organised into three main components:

1. Electronic Communications Committee (ECC) - responsible for radiocommunications and telecommunications matters.
2. European Committee for Postal Regulation (CERP) - responsible for postal matters.
3. The Committee for ITU Policy (Com-ITU) is responsible for organising the co-ordination of CEPT actions for the preparation for and during the course of the ITU activities.

T1 & ANSI

Content:

1. T1
2. T1 groups
3. ANSI
4. ANSI Formation
5. ANSI members

T1:

T1 stands for Standards Committee on Telecommunications.

It develops telecommunications standards, definitions and technical reports for USA.

T-carrier is a member of the series of carrier systems developed by AT&T Bell Laboratories for digital transmission of multiplexed telephone calls.

The first version was the Transmission System 1 (T1).

It was introduced in 1962 in the Bell System, and could transmit up to 24 telephone calls simultaneously over a single transmission line of copper wire.

T1:

T1 has 6 technical subcommittees (TSC), which are administered by T1 Advisory Group (T1AG).

For example : T1P1 (Wireless/Mobile Services and Systems), which is further divided into five subgroups:

- T1P1.1 for International Wireless/Mobile Standards Coordination
- T1P1.2 for Personal Communications Service Descriptions and Network Architectures
- T1P1.3 for Personal Advanced Communications Systems (PACS)
- T1P1.5 for PCS 1900
- T1P1.6 for CDMA/TDMA.

T1:

T1 Groups:

- T1A1 (Performance & Signal Processing)
- T1E1 (Interfaces, Power & Protection for Networks)
- T1M1 (Internetwork Operations, Administration, Maintenance, & Provisioning)
- T1S1 (Services, Architectures & Signaling),
- T1X1 (Digital Hierarchy & Synchronization).

ANSI:

ANSI stands for American National Standards Institute

It is a private non-profit organization that oversees the development of standards for products, services, processes, systems, and personnel in the United States.

The organization's headquarters is in Washington, D.C.

ANSI's operations office is located in New York City.

ANSI:

ANSI Formation:

ANSI was originally formed in 1918 by five engineering societies and three government agencies.

It named as American Engineering Standards Committee (AESC).

In 1928, the AESC became the American Standards Association (ASA).

In 1966, the ASA was reorganized and became United States of America Standards Institute (USASI).

The name ANSI was adopted in 1969.

ANSI:

ANSI Members:

- Government agencies
- Organizations
- Academic and international bodies
- Individuals.

ANSI represents the interests of more than 270,000 companies and organizations and 30 million professionals worldwide.

ARIB & TTC

Content:

1. ARIB
2. ARIB activities
3. TTC
4. TTC joint work group

ARIB:

ARIB stands for Association of Radio Industries and Businesses.

It is a standardization organization in Japan.

It strongly developed the third generation definitions of mobile communications, and interacts in cooperation with other bodies developing further stages of mobile communications.

ARIB is a participating standards organization of the Global Standards Collaboration initiative and an organizational partner of the 3rd Generation Partnership Project (3GPP).

ARIB:

Activities of ARIB:

- Investigation, research and development on utilization of radio spectrum
- Consultation and publications on utilization of radio spectrum.
- Developing of technical standards for radio systems.
- Correspondence, coordination and cooperation with international organizations.

TTC:

TTC stands for Telecommunications Technology Committee

It is a Japanese standardization body that has been actively developing mobile communications systems.

It was established in 1985 and authorized by Japan's Ministry of Internal Affairs and Communications to conduct research and to develop and promote standards for telecommunications.

TTC:

Joint Work Bodies of TTC:

1. TTA (Telecommunications Technology Association)
2. RAPA (Korea Radio Promotion Association)
3. 3GPP and 3GPP2
4. CCSA (China Communications Standards Association)
5. SMPTE (Society of Motion Picture and Television Engineers)
6. KORA (Korea Radio Station Management Agency)
7. ICU (Infocommunication Services Market Participants Union)
8. GISFI (Global ICT Standardization Forum for India)
9. ITU (International Telecommunication Union)
10. ETSI (European Telecommunications Standards Institute)

TTC:

TTC standardization area include

- Internetwork Transmission
- ISDN Internetwork Signaling
- IP Signaling, Packet and Frame Relay
- Mobile Communications
- Intercarrier Signaling Interface
- ISDN User-Network Interface
- Network Management
- NGN
- B-ISDN, PBX, LAN
- MHS/OSI
- Telematics
- Infrared Communications
- Voice Coding
- Video Coding/AV Communications
- IPTV
- Home Network.

3GPP

Content:

1. 3GPP
2. PCG
3. 3GPP specification Group
4. 3GPP Standardization Process
5. 3GPP Release

3GPP:

3GPP stands for Third Generation Partnership Project.

It was established in 1998 with the aim of developing and enhancing 3rd generation mobile communication system.

The cooperating members of 3GPP are ARIB, ETSI, T1 , TTA and TTC.

3GPP:

3GPP is formed by a main level group called PCG (Project Coordination Group).

It has total of 5 subgroups:

- Services and system aspects (SA)
- Radio access network (RAN)
- Core network (CN)
- Terminals (T)
- GSM EDGE Radio Access Network (GERAN)

3GPP:

3GPP Specification Group:

The 3GPP specification work is done in Technical Specification Groups (TSG) and Working Groups (WGs).

There are 3 TSGs each of which consists of multiple WGs:

3GPP:

1. RAN (Radio Access Network):

RAN specifies the UTRAN and the E-UTRAN. It is composed of six working groups.

- RAN WG1 - Radio Layer 1 specification
- RAN WG2 - Radio Layer 2 and Radio Layer 3 RR specification
- RAN WG3 - Iub, Iur and Iu specification – UTRAN , O&M requirements
- RAN WG4 - Radio performance, protocol and RF parameters
- RAN WG5 - Mobile terminal conformance testing
- RAN WG6 - GERAN radio and protocol

3GPP:

2. SA (Service and System Aspects):

SA specifies the service requirements and the overall architecture of the 3GPP system. It is also responsible for the coordination of the project.

SA is composed of six working groups.

- SA WG1 - Services
- SA WG2 - Architecture
- SA WG3 - Security
- SA WG4 - Codec
- SA WG5 - Telecom Management
- SA WG6 Mission-critical applications

3GPP:

3. CT (Core Network and Terminals):

CT specifies the core network and terminal parts of 3GPP. It includes the core network – terminal layer 3 protocols.

It is composed of five working groups:

- CT WG₁ - MM/CC/SM (lu)
- CT WG₂ - closed
- CT WG₃ - Interworking with external networks
- CT WG₄ - MAP/GTP / BCH/SS
- CT WG₅ - OSA (Now transferred to OMA)
- CT WG₆ - Smart Card Application Aspects

3GPP:

4. GERAN (GSM/EDGE Radio Access Network):

It was established in January 2016. The specification work on new RAN WG, RAN6 system.

- GERAN WG1 Radio access Network
- GERAN WG2 Radio Aspects
- GERAN WG3 Terminal Testing

3GPP:

3GPP standardization Process:

3GPP standardization work is contribution-driven.

Specification work is done at WG and at TSG level

1. The 3GPP WGs hold several meetings a year.
2. The 3GPP TSGs hold plenary meetings quarterly.

3GPP:

3GPP standardization Process:

3GPP follows a three-stage standardization methodology:

- Stage 1 - define the service requirements from the user point of view.
- Stage 2 - define an architecture to support the service requirements.
- Stage 3 - define an implementation of the architecture by specifying protocols.

3GPP:

3GPP Release :

- Phase 1 - 1992 - GSM Features
- Phase 2 - 1995 - GSM Features, EFR Codec
- Release 96 - 1997 - Q1 GSM Features, User Data Rate 14.4 kbps
- Release 98 - 1999 - Q1 GSM Features, AMR, EDGE, GPRS for PCS1900
- Release 99 - 2000 - Q1 first UMTS 3G networks having CDMA air interface
- Release 4 - 2001 - Q2 (Release 2000) – added features all-IP Core Network
- Release 5 - 2002 - Q1 Introduced IMS and HSDPA
- Release 6 - 2004 - Q4 Wireless LAN networks , HSUPA, MBMS, IMS
- Release 7 - 2007 - Q4 focus on HSPA+

3GPP:

- Release 8 - 2008 - Q4 First LTE release.
- Release 10 - 2011 - Q1 LTE Advanced
- Release 11 - 2012 - Q3 Advanced IP Interconnection of Services, HetNet improvements, Coordinated Multi-Point operation (CoMP). In-device Coexistence (IDC).
- Release 12 - 2015 - Q1 Enhanced Small Cells, Carrier Aggregation, MIMO
- Release 13 - 2016 - Q1 LTE enhancements, LTE-Advanced Pro.
- Release 14 - 2017 - Q2 Energy Efficiency, Location Services (LCS), Mission Critical Data over LTE
- Release 15 - 2018 - Q2 First NR release. Support for 5G Vehicle-to-x service, IP Multimedia Core Network Subsystem (IMS)

3GPP2

Content:

1. 3GPP2
2. 3GPP2 Work area
3. 3GPP2 Members

3GPP2:

The Third Generation Partnership Project 2 (3GPP2) is a third generation (3G) telecommunications specifications

It create project for the North American and Asian markets

It work with cooperation with 3GPP.

3GPP2 aim is to develop global specifications for ANSI/TIA/EIA-41 Cellular Radio telecommunication Intersystem Operations network evolution to 3G and global specifications for the radio transmission technologies (RTTs).

3GPP2:

3GPP2 Work area:

- High speed
- Broadband
- Internet Protocol (IP)-based mobile systems
- Network-to-network interconnection
- Service transparency,
- Global roaming and seamless services

3GPP2:

3GPP2 Members:

The participating members are

- ARIB
- TTC (Japan)
- China Communications Standards Association
- Telecommunications Industry Association (North America)
- Telecommunications Technology Association (South Korea)

These organizations are known as Organizational Partners (OP)

3GPP2:

3GPP2 TSG:

There are 4 Technical Specification Groups (TSG) in 3GPP2:

1. TSG-A (Access Network Interfaces)
2. TSG-C (cdma2000®)
3. TSG-S (Services and Systems Aspects)
4. TSG-X (Core Networks)

3GPP2:

3GPP

3GPP is the standard body behind the Universal Mobile Telecommunications System (UMTS) that is the 3G upgrade to GSM networks

3GPP2

3GPP2 is the standard body behind the competing 3G standard CDMA2000 that is the 3G upgrade to cdmaOne networks used mostly in the United States

Broadcast Associations

Content:

1. EBU
2. Satellite System Standardizations

EBU:

EBU stands for European Broadcasting Union.

It is a active international TV and radio broadcasting, like coordination of communications related to the Eurovision Song Contest.

The service is provide via satellite and fiber network providing transmission services to broadcasters in a global scale.

It aims is to provide transmission services with wanted quality audio and video in broadcast with file transport or streaming formats.

Its headquarter is in Geneva ,Switzerland.

EBU:

Eurovision offers four main transmission types called

- One Stop Shop
- Special Events
- Unilateral
- Space Segment.

EBU:

EBU Development and Implementation:

- Digital audio broadcasting (DAB) through Eureka Project 147 and the WorldDAB Forum.
- Digital Video Broadcasting (DVB) through the DVB Project and DigiTAG.
- Digital radio in the bands currently used for AM broadcasting through DRM (Digital Radio Mondiale).
- Standardisation of PVR systems through the TV-Anytime Forum.

Satellite System:

The standardization of satellite technologies and solutions is performed in various standardization bodies.

- ESA and NASA - representatives of applied space technology and investigation, and produce highly proprietary solutions as well as globally standardized definitions.
- IMT-Advanced systems - is a telecommunication standard that provide multimedia broadcasting and multicasting services.