ITU-T Study Group 13; Current & Future

Mandates

ITU-T SG13: Future networks and emerging network technologies

The international standards (ITU-T Recommendations) developed by ITU-T Study Group 13 (SG13) address the requirements, architectures, functional capabilities and application programming interfaces of **converged future networks**. Key areas of focus include network softwarization and orchestration, information-centric networking, content-centric networking, and the application of **machine learning technologies**.

SG13 focuses on **non-radio networking aspects of IMT-2020 and beyond**, a responsibility that includes project-management coordination across all ITU-T study groups and the planning of standards releases.

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

SG13 studies aspects of **fixed, mobile and satellite convergence** for multi-access networks, mobility management, and enhances existing ITU-T Recommendations on mobile communications, including the energy-saving aspects.

It develops standards for **quantum key distribution networks, 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..

Leading roles

Lead Study Group Roles of ITU-T 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

Management (SG leaders)

Chairman:

- **Kazunori TANIKAWA (NICT, Japan)**

Vice-chairmen:

- Faleh AL-GHAMDI, Saudi Arabia
- Bülent ARSAL, Turkey
- Obid ASADOV, Uzbekistan
- **Rim BELHASSINE-CHERIF, Tunisia**
- **Soumaya BENBARTAOUI, Algeria**
- Anabel DEL CARMEN CISNEROS, Argentina
- Hyung-Soo (Hans) KIM, Korea (Rep. of)
- Scott MANSFIELD, Canada
- Mark MCFADDEN, UK
- **Brice MURARA, Rwanda**
- Mehmet TOY, USA
- Abhay Shanker VERMA, India
- Yuan ZHANG, China

Secretariat:

- **Tatiana Kurakova** (Counsellor), **Shaba Karimova**

Management (WP leaders)

- **WP1/13 Chairman**

  Hyung-Soo (Hans) KIM
  KT Corporation, Korea (Rep. of)

- **WP1/13 Vice-chairmen**
- **Alojz HUDOBIVNIK**
  SIST, Slovenia
- **Lu LU**
  China Mobile, China
- **Scott Mansfield**
  Ericsson, Canada

- **WP2/13 Chairman**
- **Yuan ZHANG**
  China Telecom, China

- **WP2/13 Vice-chairmen**
- **Soumaya BENBARTAOUI**
  Algerian Regulator of Post and Electronic Communication, Algeria
- **Kangchan LEE**
  ETRI, Korea (Rep. of)

- **WP3/13 Chairman**
- **Gyu Myoung LEE ,**
  Korea

- **WP3/13 vice-chairman**
- **Rim BELHASSINE-CHERIF**
  Tunisie Télécom, Tunisia
- **Mark MCFADDEN**
  UK

IMT-2020 and Beyond: Networks & Systems

- Q6/13: Networks beyond IMT2020: Quality of service (QoS) mechanisms
- Q20/13: Networks beyond IMT-2020 and machine learning: Requirements and architecture
- Q21/13: Networks beyond IMT-2020: Network softwarization
- Q22/13: Networks beyond IMT-2020: Emerging network technologies
- Q23/13: Networks beyond IMT-2020: Fixed, mobile and satellite convergence

Cloud Computing & Data Handling

- Q7/13: Future Networks: Deep packet inspection and network intelligence
- Q17/13: Future Networks: Requirements and capabilities for computing including cloud computing and data handling
- Q18/13: Future Networks: Functional architecture for computing including cloud computing and data handling
- Q19/13: Future Networks: End-to-end management, governance, and security for computing including cloud computing and data handling

Network Evolution, Trust and Quantum Enhanced Networking

- Q1/13: Future Networks: Innovative service scenarios, including environmental and socio economical aspects
- Q2/13: Next-generation network (NGN) evolution with innovative technologies including software-defined networking (SDN) and network function virtualization (NFV)
- Q5/13: Applying Future Networks and innovation in developing countries
- Q16/13: Future Networks: Trustworthy and Quantum Enhanced Networking and Services

Related groups

- **SG13 Regional Group for Africa (SG13RG-AFR)**
- **SG13 Regional Group for EECAT (SG13RG-EECAT)**
- **ITU-T Focus Group on Autonomous Networks (FG-AN)**
- **Joint Coordination Activity on Machine Learning (JCA-ML)**
- **Joint Coordination Activity on IMT2020 (JCA-IMT2020)**
- **Joint Coordination Activity on Quantum Key Distribution Network (JCA-QKDN)**
- **FG-NET2030, FG-ML5G, JCA-IdM,...**

SG13: All about networks

Work area:

- **Future networks:**
  networks beyond IMT-2020 (non-wireless parts), fixed-mobile-satellite convergence
- **Evolving computing paradigm:** data handling and processing, computing and network convergence
- **AI to serve networks:** machine leaning and programmable networking solutions towards autonomous operation

SG13 opens the new horizons

New work started in the last Study Period includes:

- **Machine Learning**
- **Fixed, mobile and satellite convergence**
- **Quantum key distribution (networks)**
- **Decentralized network infrastructure**
- **Intent-based network**
- **Digital twin network**
- **Deterministic communication services**
- **Container in cloud computing, micro-services**
- **Socio-technical standards, etc.**

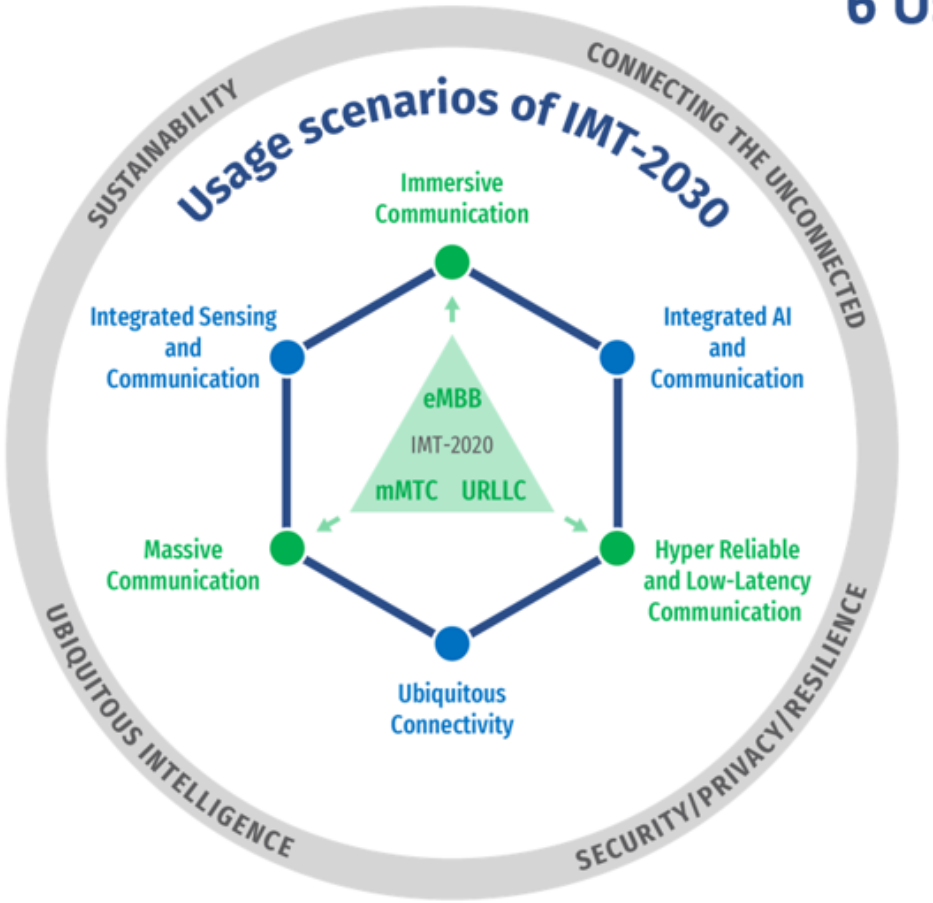
In short, SG13 today

- **Innovative**: New ideas from research arms: digital twin, intend-based networks, autonomous networks
- **Reliable**: Enhancements to the existing networks
- **Practicable**: Mobile communications (network aspects)
- **Intelligent**: Cloud computing, big data, future computing and processing enabling AI/ML
- **Modern**: Networks of the future (evolving edge computing)
- **Solution oriented**: New secure technics for networks (QKDN)
- **Supportive**: Assistance and solutions for developing countries

ITU workshop on “Future technology trends towards 2030

- IMT-2030
- The next web
- Quantum Network
- Deterministic comm. & services

IMT-2030 Framework



So called "Wheel diagram"

6 Usage scenarios

Extension from IMT-2020 (5G)

- eMBB → Immersive Communication
- mMTC → Massive Communication
- URLLC → HRLLC (Hyper Reliable & Low-Latency Communication)

New

- Ubiquitous Connectivity
- Integrated AI and Communication
- Integrated Sensing and Communication

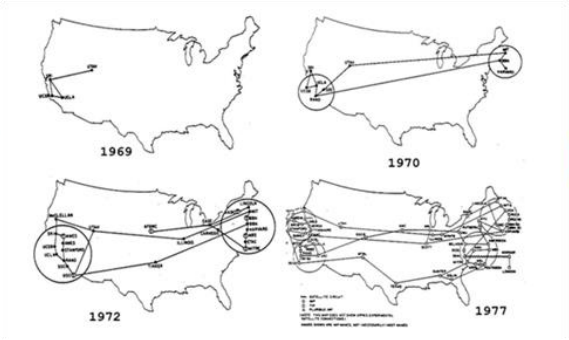
4 Overarching aspects:

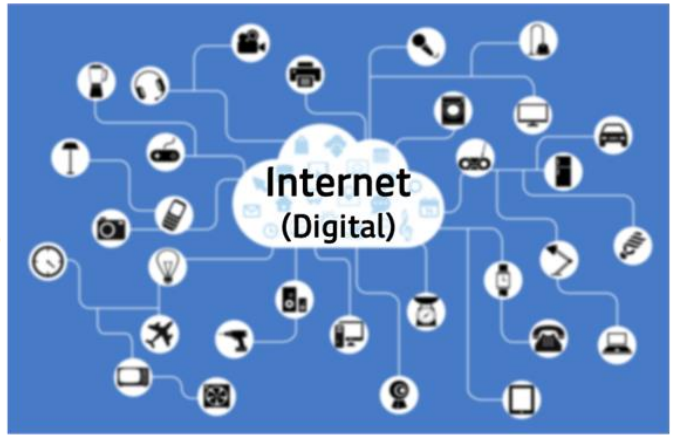
act as design principles commonly applicable to all usage scenarios

Sustainability, Connecting the unconnected,
Ubiquitous intelligence, Security/privacy/resilience

Quantum Network/Internet

<Digital Computer, 1969>





<Quantum Computer, 2019>

Quantum Internet;
"a network of Quantum Networks"

Quantum Network;
A network enabled by quantum information technology between Quantum nodes
(ex, Quantum Computers, Quantum Sensors, QKD modules, etc.).

Expected key strategic areas (Study Period 2025 - 2028)

- IMT-2030
- Orchestration of networking and computing
- Autonomy of networking
- Emerging technologies
  - Quantum network, network digital twins, networking for Web 3.0, Trustworthiness, FMSC, etc.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