ITU-T SG13 WP1; 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 (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

Approved ITU-T Recommendations of WP1

Y.31xx series: IMT-2020 – more than 60 Recs.

- Y.3100, ‘Terms and definitions for IMT-2020 networks
- Y.3182, ‘Machine learning based E2E multi-domain network slice management and orchestration’

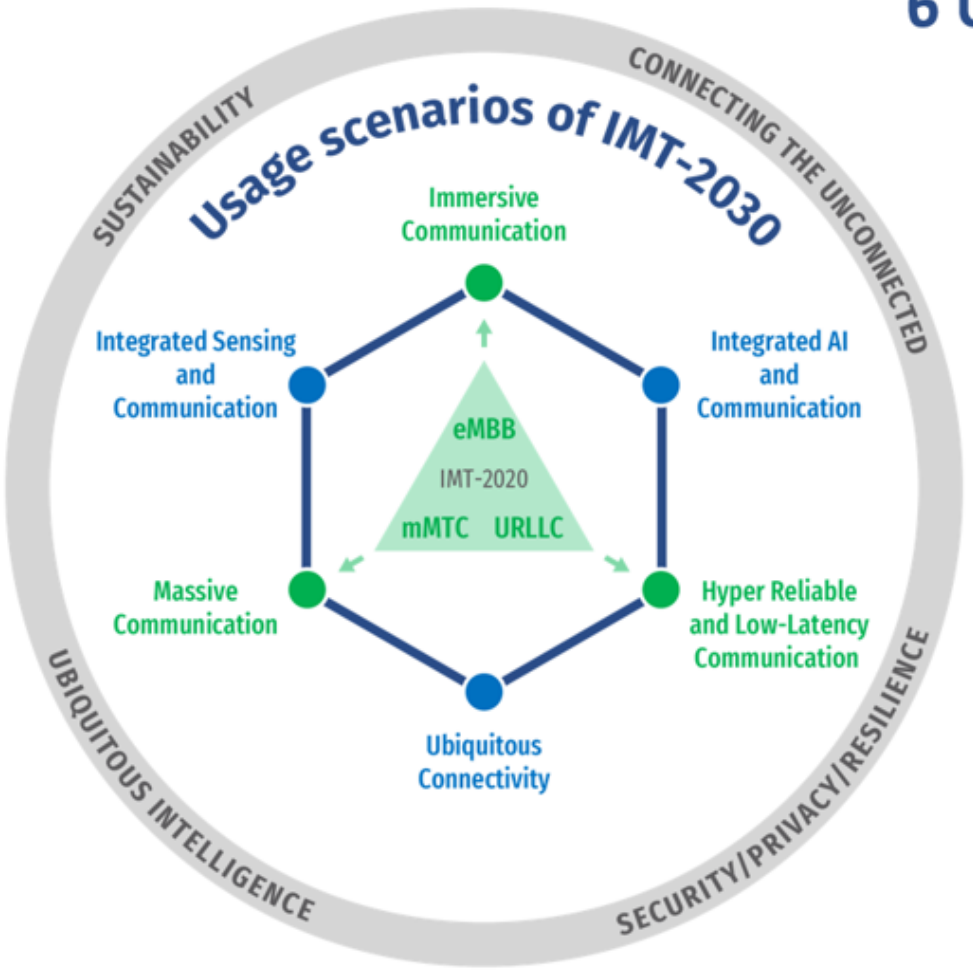
Y.32xx series: beyond IMT-2020 (IMT-2030) – 6 Recs. (on-going 30 Recs.)

- Y.3200, ‘Fixed, mobile and satellite convergence – requirements for IMT-2020 networks beyond’

Y.38xx series: QoS for Quantum key distribution network – 8 Recs. (on-going 5)

- Y.3806, ‘Quantum key distribution networks – requirements for quality of service assurance’

IMT-2030 Framework – Wheel diagram (2023.06)



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:

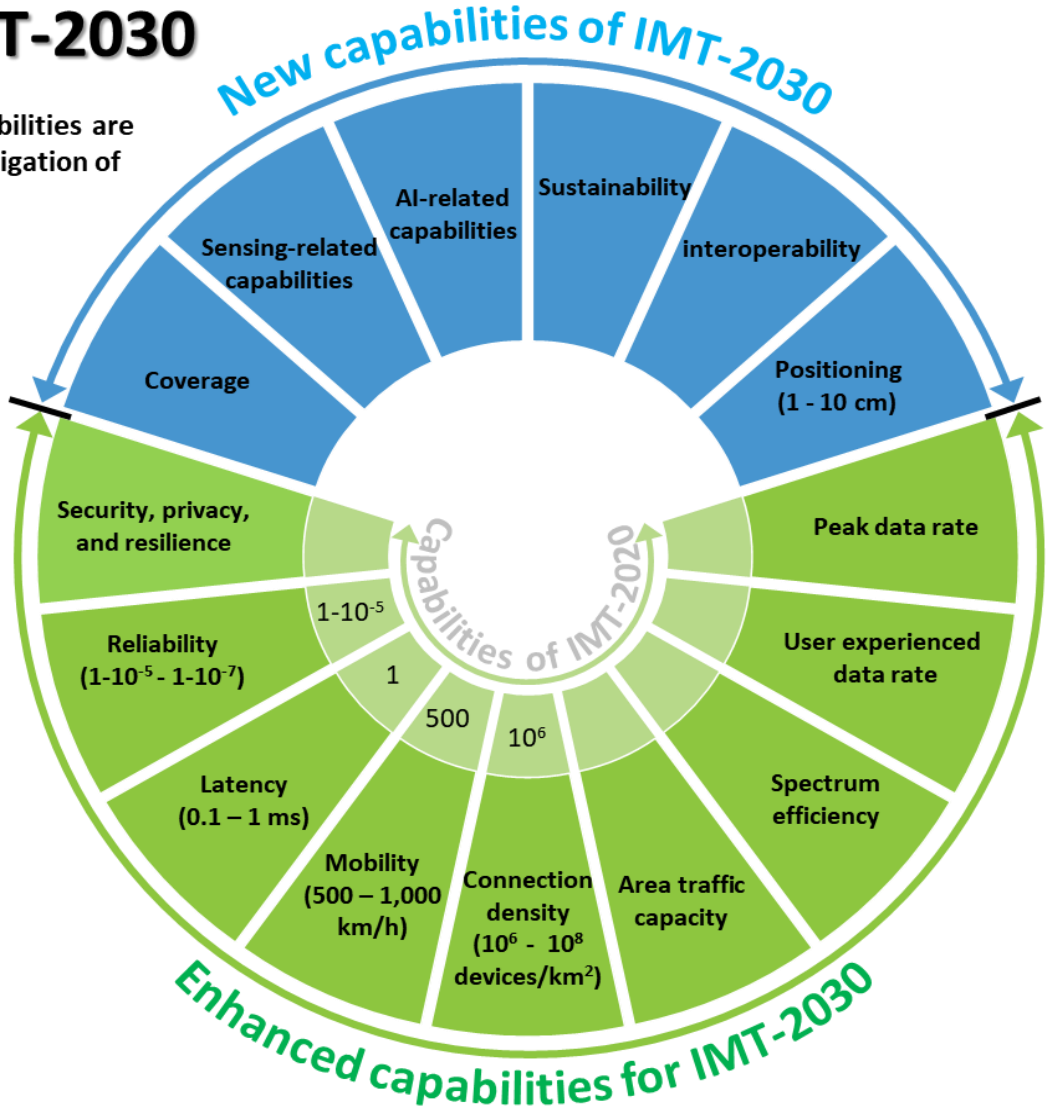
act as design principles commonly applicable to all usage scenarios

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

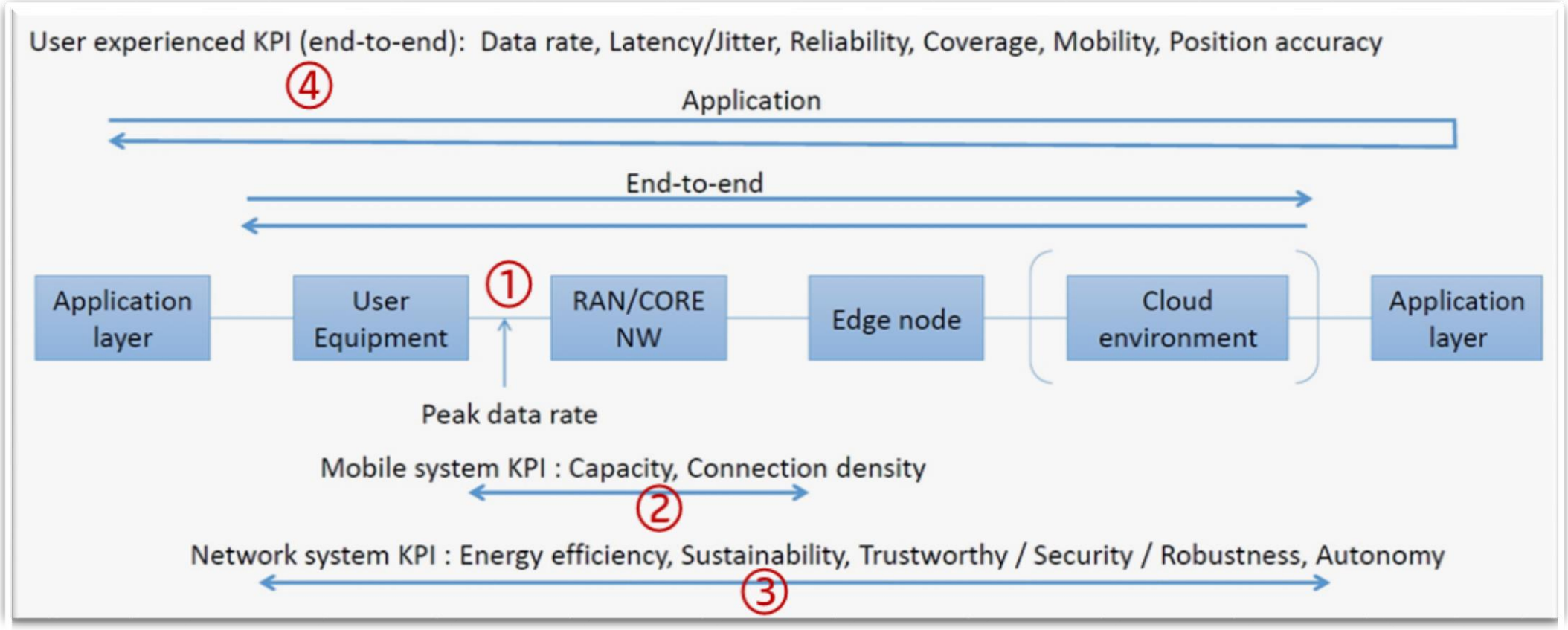
IMT-2030 Framework – Palette diagram (2023.06)

Capabilities of IMT-2030

NOTE: The range of values given for capabilities are estimated targets for research and investigation of IMT-2030.



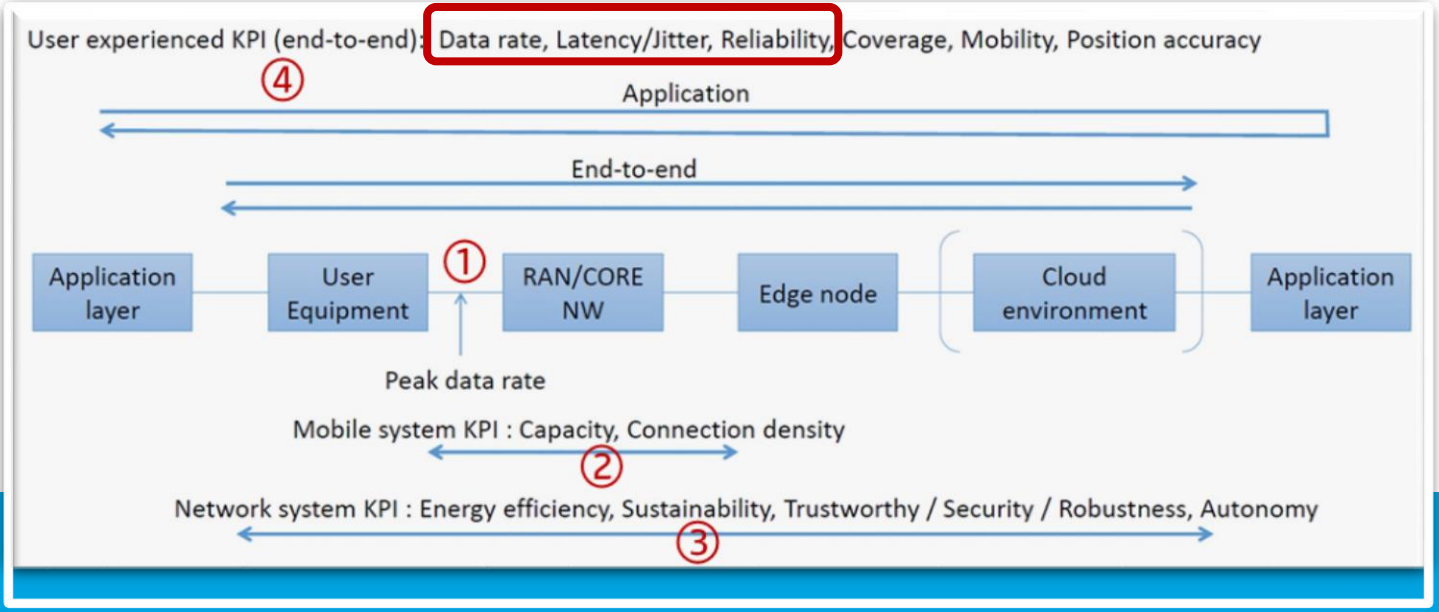
Role of non-radio aspects in IMT networks



① & ② = Radio aspect - oriented

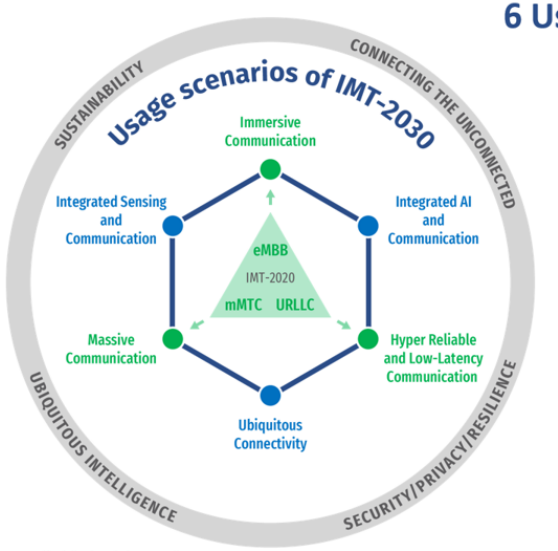
③ & ④ = Radio with non-radio aspects - essential

- Q6/13: Networks beyond IMT2020: Quality of service (QoS) mechanisms
  - **End-to-end QoS/QoE** assurance and application specific QoS requirements
  - Use of varied types of transport technology in the core network, in the access network, in endpoints and multiple administrative domains in an end-to-end path
  - Network resource optimization and orchestration for QoS/QoE enablement
  - Use of AI/machine learning mechanisms
  - Application and QoS/QoE mapping and its automation
  - QoS assurance mechanisms for vertical sector applications



- Q20/13: Networks beyond IMT2020 and machine learning: Requirements and architecture

  - Study of the requirements, architecture and use of technologies including AI/ML
  - **Integration of AI/ML applications** is regarded as one of the key architectural aspects for IMT
  - Interworking of IMT networks with current networks
  - Ecosystem aspects taking into account business models and use cases



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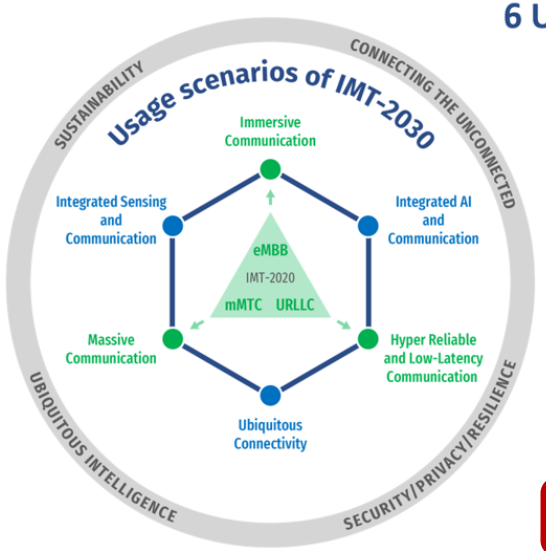
- # Q21/13: Networks beyond IMT2020 : Network softwarization

  - Study of framework, service scenario, requirements, and architecture of **network softwarization in IMT**
  - Requirements, functional architecture and mechanisms for network softwarizion including generic **SDN**
  - Profiles for intent-based networking, network virtualization, network slicing, **NFV** and virtualized applications
  - Management and orchestration of homogeneous/heterogeneous types of softwarized infrastructure
  - Capability in support of network softwarization by using **enhanced APIs and AI-assisted** functionalities



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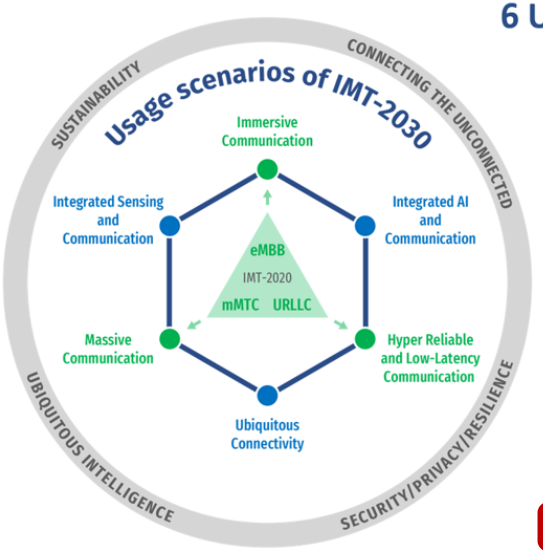
- Q22/13: Networks beyond IMT2020 : Emerging network technologies

  - Study of the enhancement of data-aware networking (DAN) including information-centric networking (ICN)
  - Study of Future packet-based network (FPBN) including public telecommunication data network (PTDN)
  - The applications and deployment of **DAN/ICN, FPBN/PTDN, and Industrial networks in IMT**
  - With component technologies of **in-network computing, big data analysis, DLT/block-chain, AI/ML**



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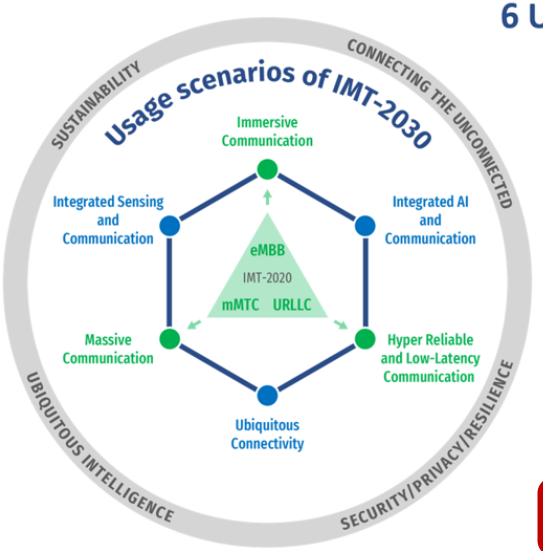
- Q23/13: Networks beyond IMT2020 : Fixed, mobile and satellite convergence

  - Study of fixed, mobile and satellite convergence in IMT; requirements and use cases
  - Applications of innovative network and IT technologies in **FMSC for IMT**; land and satellite convergence, AI/ML, DLT, quantum information technologies, etc.
  - Enhanced interfaces and procedures in support of FMSC
  - **Full connectivity** for various types of user equipment



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ITU workshop on “Future technology trends towards 2030

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

Expected key strategic actions (Study Period 2025 - 2028)

- Harmonizing on-going studies with IMT-2030
  - FMSC, CNC, Digital Twin, AI/ML for & by network, etc.
- Studying potential new architectural directions to accommodate IMT-2030 use cases and features
  - Deterministic comm., Disaggregated data/control place, etc.
- Supporting E2E requirements of IMT-2030
  - Quality of service, trustworthiness, security, privacy, etc.


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