# Terms of Reference:
# ITU-T Focus Group on "Technologies for Network 2030" (FG-NET-2030)

## 1 Rationale and Scope

The coming decade will see swift changes in technologies pertaining to novel types of devices, systems and functions they perform. New applications with diverse requirements will also begin to emerge, such as holographic multimedia, instantaneous data delivery and movement, remote surgery, humanoid robots, intelligence-enabled tiny IoT terminals, fully autonomous transportation system, and so forth. Everything will either be connected or equipped with intelligence, often both, which provides an even tighter integration of communication and technology with human life.

The massive adoption of these new applications is contingent on how well the underlying communications are supported at a large scale over the hyper-connected networks. Therefore, a further evaluation of the relevant network architecture with the associated enabling technologies is highly demanded.

Network 2030 is a new network towards 2030 and beyond, addressing not only shorter latency and higher capacity, but also possibly support of multi-dimensional information delivery approaches, such as holographic type communications with haptic sensing, instantaneous multi-type information teleportation with determinacy, and the like.

In the study of network 2030 architecture, many new communication requirements are expected to emerge that are more sensitive to resource demands and must be satisfied, specifically:

– Astronomical amount of connections beyond the limitation of current and near future networks including 5G/IMT-2020;
– Very-high throughput to support explosive bandwidth-intensive future applications beyond the limitation of current and near future networks including 5G/IMT-2020;
– Super-ultra-low latency networking, with deterministic guarantee beyond the limitation of current and near future networks including 5G/IMT-2020;
– Trustable network infrastructure;
– Human safety and privacy centric reliable networking mechanism, and so forth.

The Focus Group, i.e., FG-NET-2030, intends to study the capabilities of future networks roughly in the period of 2025-2035, when it is expected to support future-oriented new scenarios, such as holographic telepresence, industrial avatars, extremely fast response in critical situations. The study aims to answer specific questions on what kinds of network architecture and the enabling mechanisms are suitable for such novel scenarios.

The future network towards 2030 and beyond, which is named as Network-2030, will be realized by the exploration of on-the-wire communication mechanisms from many broader perspectives not restricted by existing notions of network layers or to any particular technologies nowadays. Thus, it may be built upon a new network layer or new network architecture to carry information in a manner that may be an evolution and refinement of existing networks or quite different from. However, it should ensure that the future network systems and applications remain fully backward compatible.

The FG-NET-2030, as a platform to study and advance international networking technologies, will investigate the future network architecture, requirements, use cases, and capabilities of the networks for 2030 and beyond.

## 2 Objectives of the FG-NET-2030

The objective of the FG is to carry out a broad analysis for future networks towards 2030 and beyond. In order to formulate a right vision, this FG is expected to identify the gaps and challenges based on latest networking technologies, and derive fundamental requirements from novel use cases. In addition, the FG intends to formulate an overall framework of Network 2030, while innovative technical enablers are expected to be proposed. Furthermore, this FG also can serve as an open platform for experts representing ITU members and non-members to quickly move forward the standard develop of future networks at ITU-T, mainly targeting on future networks in the coming decade.

More precisely, the objectives include:

– To study, review and survey existing network technologies, network platforms, and network standards for identifying the gaps and challenges towards Network 2030, which are not supported by the existing and near future networks like 5G/IMT-2020.

– To formulate all network aspects of Network 2030, including vision, requirements, architecture, novel use cases, evaluation methodology, and so forth as related to the fixed network.

– To provide guidelines for network standardization roadmap.

– To establish liaisons and relationships with other SDOs such as ITU-R WP 5D for addressing radio access network aspects.

It should be noted that the work within FG NET-2030 is limited to network and wireline aspects while work on the radio access network for the terrestrial component IMT is under the responsibility of ITU-R WP 5D. Work on wireline aspects related to the radio access network for the terrestrial component IMT will be coordinated with ITU-R WP 5D.

## 3 Structure

The FG-NET-2030 may establish sub-groups if needed.

## 4 Specific Tasks and Deliverables

The expected tasks with potential deliverables for fixed network and inter-networks are listed below:

1) To identify the gaps and challenges of network aspects which are not supported by existing and near future technologies, including new network layer or new network architecture.

2) To identify network performance targets of Network 2030 that is beyond the limitation of existing and near future networks.

3) To make a report on the related definitions, terminologies and taxonomy for Network 2030 and the relevant eco-system.

4) To describe the potential network architecture and framework of Network 2030.

5) To analyse the backward compatibility and steps towards Network 2030, based on existing and near future networks.

6) To study the future network scenarios and use cases.

7) To draft a report on describing the related standardization gaps for ITU-T study groups.

8) To organise thematic workshops and forums on Network 2030, which will bring together all stakeholders, and promote the FG activities and encourage both ITU members and non-ITU members to jointly contribute on this work.

9) To make liaison with other SDOs, such as ETSI specific ISGs, IETF, IRTF.

## 5 Relationships

The FG will work closely with SG13 through co-located meetings when possible, and will also work in close coordination with other ITU-T Study Groups as appropriate whenever necessary.

This FG-NET-2030 will collaborate with other relevant groups and entities, in accordance with Recommendation ITU-T A.7, which may include municipalities, non-governmental organizations (NGOs), policy makers, SDOs, industry forums and consortia, companies, academic institutions, research institutions and other relevant organizations.

## 6 Parent group

The parent group of the FG-NET-2030 is ITU-T Study Group 13 "Future networks, with focus on IMT-2020, cloud computing and trusted network infrastructures".

## 7 Leadership

See clause 2.3 of Recommendation ITU-T A.7.

## 8 Participation

See clause 3 of Recommendation ITU-T A.7. A list of participants will be maintained for reference purposes and reported to the parent group. It is important to mention that the participation in this FG has to be based on contributions and active participations.

## 9 Administrative support

See clause 5 of Recommendation ITU-T A.7.

## 10 General financing

See clauses 4 and 10.2 of Recommendation ITU-T A.7.

## 11 Meetings

The FG will conduct regular meetings. The frequency and locations of meetings will be determined by the FG management. The overall meetings plan will be announced after the approval of the terms of reference. The FG will use remote collaboration tools to the maximum extent, and collocation with existing SG13 meetings is encouraged.

The meeting dates will be announced by electronic means (e.g., e-mail and website, etc.) at least four weeks in advance.

At least the last meeting of the FG should be held with the SG13 meeting.

## 12 Technical contributions

See clause 8 of Recommendation ITU-T A.7.

## 13 Working language

The working language is English.

## 14 Approval of deliverables

Approval of deliverables shall be taken by consensus.

## 15 Working guidelines

Working procedures shall follow the procedures of Rapporteur meetings. No additional working guidelines are defined.

## 16 Progress reports

See clause 11 of Recommendation ITU-T A.7.

## 17 Announcement of Focus Group formation

The formation of the Focus Group will be announced via TSB Circular to all ITU membership, via the ITU-T Newslog, press releases and other means, including communication with the other involved organizations.

## 18 Milestones and duration of the Focus Group

The Focus Group lifetime is set for one year from the first meeting but extensible if necessary by decision of the parent group. (see ITU-T A7, clause 2.2).

## 19 Patent policy

See clause 9 of Recommendation ITU-T A.7.

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