



Question(s): 12/15

Geneva, 13-24 October 2025

LS
(Ref.: TD154/Plen-Annex G)**Source:** ITU-T Study Group 15**Title:** LS on approval of Technical Report on International Optical Networks towards 2030 and Beyond (ION-2030)**LIAISON STATEMENT****For action to:** ITU-R SG5, ITU-R WP5D, ITU-T SG13, ITU-T SG20, ITU-T SG21, 3GPP, OIF, IOWN GF**For information to:** IEEE 802, Broadband Forum, ETSI ISG F5G, IETF Routing Area**Approval:** ITU-T SG15 meeting (Geneva, 24 October 2025)**Deadline:** 1 June 2026**Contact:** Stephen Shew
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Abstract: This liaison statement announces the agreement of ITU-T Technical Report GSTR-ION-2030, introduces the key contents, and invites feedback that can influence future standards development activities.

We are pleased to inform you that at our 13-24 October 2025 plenary meeting, ITU-T SG15 has published a technical report intended to guide the evolution of optical networks. The technical report is attached, and its key contents are summarized below.

International Optical Networks towards 2030 and Beyond (ION-2030) is a strategic framework developed by ITU-T Study Group 15 to guide the evolution of International Optical Networks. It supports emerging technologies and societal goals including IMT-2030, Artificial Intelligence (AI), Data Centres, and Broadband Access. The report targets analysts, CTOs, and product managers, aiming to define capabilities, usage scenarios, and a standardization roadmap for next-generation optical networks.

Key Trends identified are:

1. IMT-2030: Emphasizes ubiquitous intelligence, immersive multimedia, digital twins, smart industries, and sustainability. Optical networks must support high bandwidth, low latency, and precision synchronization.
2. AI: AI enhances network operations via multimodal models, digital twins, autonomous agents, and energy-saving mechanisms. Optical networks also enable edge AI and AI-as-a-service.

3. Data Centres: Requires ultra-high bandwidth (400G/800G+), low-latency, and energy-efficient optical links with synchronization for distributed computing.
4. Broadband Access: Transition from copper to fiber with advanced PON technologies supporting gigabit and 10G+ services, integrated with in-premises networks and IoT.

ION-2030 Capabilities are:

1. Enhanced connectivity: Tbps line capacity, sub-ms latency, high reliability, and deterministic service assurance.
2. New capabilities: Integrated sensing (DFOS, feed forward), computing, AI agents, energy efficiency (picoJoules/bit), and quantum-resistant security.

Architectures and Technologies:

1. IMT-2030: backhaul/fronthaul, 100GE–1.6TE interfaces.
2. AI: AI-native optical networks, distributed computing, digital twins.
3. Data Centres: ROADM/OXC switching, CPO/LPO/OCS for energy efficiency.
4. Broadband Access: VHSP PON (200G+), Wi-Fi fronthauling, AI-enhanced networks.
5. ISAC: DFOS and feedforward sensing for infrastructure protection.

Standardization Roadmap:

1. Collaboration with ITU-R, SG13, 3GPP, Broadband Forum, IEEE 802, ETSI ISG F5G, OIF, IETF Routing Area
2. Continuous evolution post-2030 to support sustainability and innovation

ION-2030 presents a comprehensive vision for future optical networks, integrating AI, sensing, computing, and sustainability. It lays the foundation for global standardization and deployment, enabling inclusive digital transformation and supporting the United Nations Sustainable Development Goals.

ITU-T SG15 invites feedback to ION-2030 to areas delineated in this technical report: ION-2030 for IMT-2030, ION-2030 for AI and AI for ION-2030, ION-2030 for Data Centre, ION-2030 for broadband access. This will assist in the development of work items for standards development within SG15.

The next ITU-T SG15 plenary meeting will be 29 June – 10 July 2026

Attachment: TD124R1/PLEN