GSTR.ION-2030 Technical Report on International Optical Networks towards 2030 and Beyond (ION-2030)

Overview

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 assists those aiming to define capabilities, usage scenarios, and future standardization topics for next-generation optical networks.

Key Trends

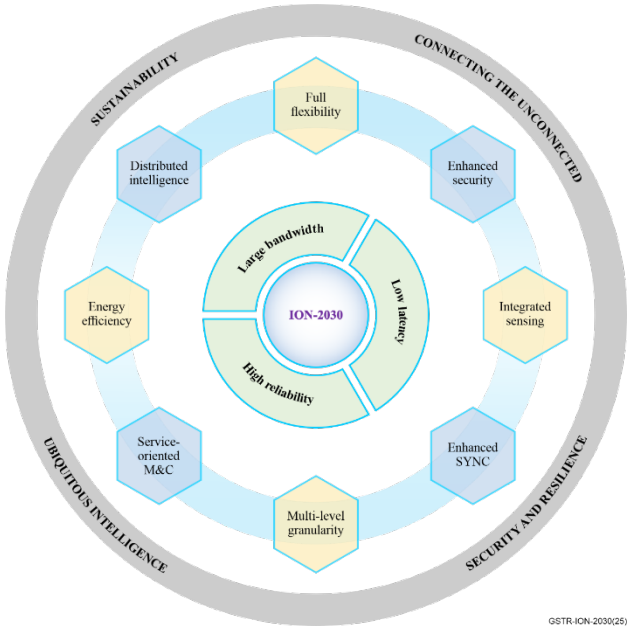
- Enhancements to network operations via AI capabilities such as network digital twins.
- Optical networks also enable edge AI and AI-as-a-service.

ION-2030 Architectures and Technologies

- Enhanced connectivity: Tbps line capacity, sub-ms latency, high reliability, and deterministic service assurance.
- New capabilities: Integrated sensing, computing, AI agents, energy efficiency, and quantum-resistant security.

Standardization Community

- Collaboration with ITU-R, SG13, 3GPP, BBF, IEEE, ETSI, OIF, IETF.
- Continuous evolution post-2030 to support sustainability and innovation.



ION-2030 characteristics and features

Conclusion

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.

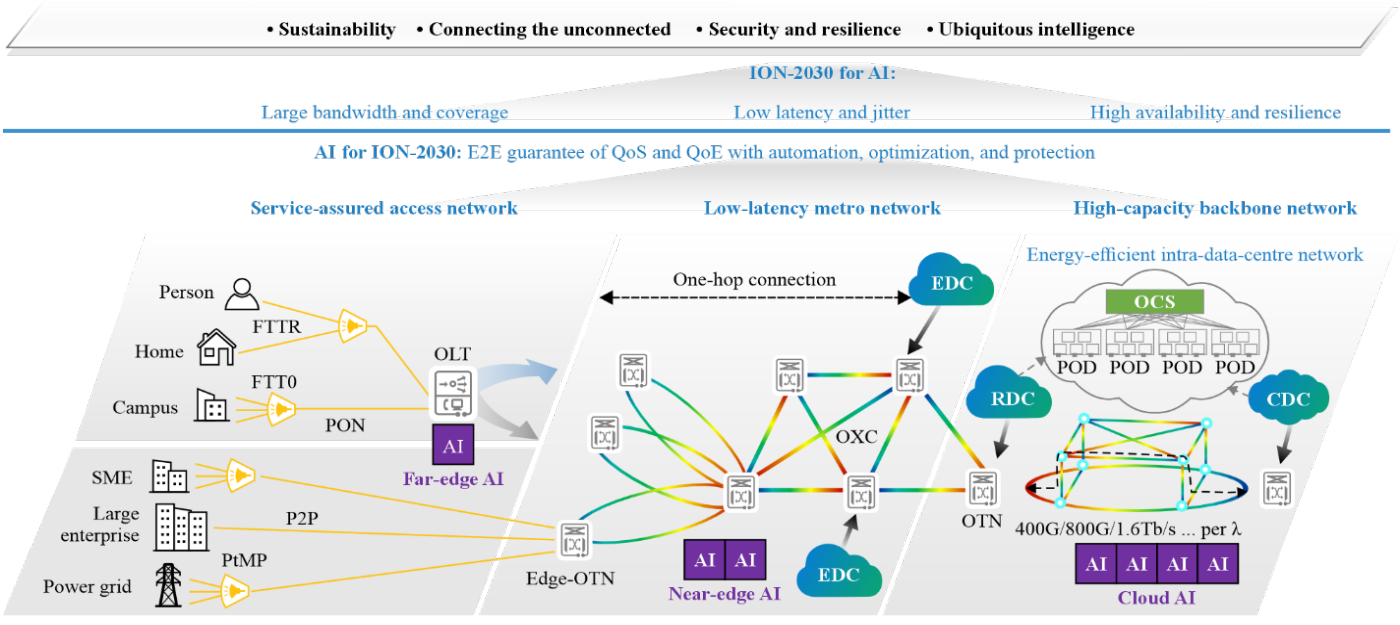


Illustration of an AI-era optical network (AI-ON) architecture with ubiquitous AI