

Collaboration on 10G optical communication equipment



Overview

Exail trials 10G earth-to-space optical comms Exail has successfully trialled 10 Gbps optical downlink and uplinks between the TELEO geostationary in-orbit.

Key Takeaways

Collaboration in 10G optical communication spans industry partnerships, standardization, and pilot programs to advance high-speed optical networks both on Earth and in space. Space-Based 10G Optical Collaboration

Exail, in partnership with Airbus Defense & Space and CNES (French Space Agency), successfully trialled 10 Gbps optical uplinks and downlinks between the TELEO geostationary satellite and ground stations. Exail developed and space-qualified the optical transceiver, including low-noise optical amplifiers, lithium-niobate modulators, and RF amplifiers, while also contributing to optical ground stations. This collaboration demonstrates the integration of multiple organizations' expertise to advance high-speed optical communication in space, paving the way for future operational systems and quantum communication applications (QKD) in orbit .

Terrestrial 10G Optical Networks



On Earth, collaboration is equally critical. Operators, suppliers, and contractors work together to implement 10G passive optical networks (PON) and hybrid fiber-coax (HFC) systems. Corning emphasizes that industry-wide partnerships are essential to manage heterogeneous networks, optimize existing fiber infrastructure, and plan cost-effective deployment strategies. Dense Wavelength Division Multiplexing (DWDM) and flexible optical architectures are leveraged to maximize capacity and reduce labor costs .

Standardization and Regulatory Frameworks

The ITU-T G.987.3 standard defines the transmission convergence layer for 10G-capable PON systems, ensuring interoperability and consistent performance across point-to-multipoint optical access networks. This standard is maintained through international collaboration and periodic updates, providing a framework for equipment manufacturers and network operators to align their technologies .

Pilot Programs and Global Deployment

Countries like China are actively piloting 10G-PON networks in residential, educational, and industrial settings, fostering collaboration between government agencies, operators, and equipment vendors. These pilots aim to validate performance, build industrial chains, and accelerate large-scale deployment of 10G optical networks . Globally, operators such as Huawei and over 55 service providers have launched 10G packages, with 50G PON verifications completed, highlighting the importance of coordinated efforts among operators, regulators, and technology partners to meet growing broadband demands .

Key Takeaways

- Cross-industry collaboration is essential for both space and terrestrial 10G optical systems.
- Standards like ITU-T G.987.3 ensure interoperability and guide equipment development.
- Pilot programs accelerate technology validation and industrial chain development.
- Integrated planning among operators, suppliers, and contractors optimizes network performance, cost, and scalability. These collaborative efforts collectively enable the deployment of high-speed, reliable, and scalable 10G optical communication networks worldwide, supporting applications from smart homes and cloud services to space-based quantum communications.

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