

Recommendation

ITU-T L.250 (01/2024)

SERIES L: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

Optical infrastructures – General aspects and network design

Topologies for optical access network

ITU-T L-SERIES RECOMMENDATIONS

Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

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Recommendation ITU-T L.250

Topologies for optical access network

Summary

Recommendation ITU-T L.250 describes the optical access network to be used in the design and construction of fibre to the x (FTTx), centralized – radio access networks (C-RAN) for mobile communications, and other network services. It deals mainly with access network architectures and the upgrading or new deployment of optical fibre to optical access networks.

History *

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Introduction

Progress in telecommunications technologies has led to the active development of many kinds of broadband services such as data and video communication using access networks. It is important that high-speed broadband optical access networks be developed economically to provide services directly to subscribers, connected things and mobile communication devices. To provide these services in a timely manner, it is necessary to construct optical access networks quickly, efficiently and cost-effectively.

In the past decade, progress in the application of optical fibre technology in local access networks for fibre to the home (FTTH) has provided substantial technical and economic benefits in several countries. The development of "smart city", "Internet of things" (IoT) and "industrial Internet" has broadened the scope of areas by which the optical network can access the services. 5G mobile communication network construction is in progress in many countries and centralized – radio access networks (C-RAN) could save costs on base station sites, equipment, room rent and energy compared with traditional distributed – radio access network (D-RAN).

Here, an optical access network contains a network of optical fibre cables that extend from a carrier's central office to cabinets, buildings, individual homes, apartment blocks, business offices, workshops, smart city equipment boxes, smart poles or mobile telecommunication base stations.

Recommendation ITU-T L.250

Topologies for optical access network

1 Scope

This Recommendation defines optical single-mode fibre access network architectures and provides information on planning new deployments and upgrading existing networks. Moreover, this Recommendation considers optical transmission performance and optical safety which depends on the architecture design of an optical access network.

This Recommendation covers:

- definitions and general features of fibre level and cable level architectures that have been used to meet different system objectives;
- convergence architectures for upgrading the performance of the optical access network;
- physical components within the network architectures;
- optical safety requirements;
- installation issues.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

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