

Article Overview

An optical splitter in a network topology diagram represents a passive device that divides a single optical signal from the OLT into multiple outputs for end-user ONTs, enabling shared fiber connectivity in PON networks.

Function of Optical Splitters

Optical splitters are passive devices that take one input optical signal and split it into multiple outputs without requiring power, making them essential for cost-efficient FTTH deployments . They allow a single Optical Line Terminal (OLT) port to serve multiple Optical Network Terminals (ONTs), reducing the need for dedicated fibers to each subscriber and lowering infrastructure costs . Splitters can be centralized (located near the OLT) or cascaded/distributed (deployed in stages across the network) to achieve the desired split ratio .

Split Ratios and Types

Split ratios define how many outputs a single input is divided into, commonly in powers of two (1x2, 1x4, 1x8, 1x16, 1x32, 1x64), though odd ratios like 1x3 or 1x5 are also used . Two main types of splitters are:

- o PLC (Planar Lightwave Circuit) Splitters: Highly uniform, suitable for large splits (1x32, 1x64), and widely used in outdoor cabinets .
- o FBT (Fused Biconical Taper) Splitters: Cost-effective for small splits (1x2, 1x4), often used in test environments or low-port-count scenarios .

Representation in Network Topology Diagrams

In a network topology diagram, an optical splitter is typically depicted as a node or box connecting one input fiber from the OLT to multiple output fibers leading to ONTs. Key points include:

- o Centralized Split: A single splitter near the OLT with multiple outputs branching directly to subscribers.
- o Cascaded Split: Multiple splitters in series (e.g., 1x4 followed by 1x8) to achieve a higher split ratio like 1x32, often used in distributed networks .
- o Unbalanced Split: Some outputs carry more optical power than others, represented in diagrams with labeled output ratios or directional arrows .

Practical Considerations

- o Bandwidth Sharing: Each ONT shares the bandwidth of the PON, but as long as optical power is sufficient,

Optical Splitter in Network Topology Diagram

performance is maintained .

- o Scalability: Adding new subscribers may only require connecting additional ONTs to existing splitter outputs if capacity allows .
- o Deployment Location: Splitters are often housed in closures, pedestals, or wall-mounted cabinets, which can be annotated in diagrams for clarity . In summary, optical splitters are critical passive components in PON networks, and in topology diagrams, they visually indicate the branching of optical signals from a single OLT to multiple ONTs, reflecting both the network's physical layout and its logical signal distribution.

The main components and general architecture of the FTTH network at any telecom operators include the Optical

1. Fiber optic splitter types by network topology PLC optical splitter VS FBT optical splitter The splitting principles of

The distributed splitter configuration involves placing splitters throughout the network rather than centralizing them (see Figure 3).

By dividing a single optical signal from a central Optical Line Terminal (OLT) into multiple outputs for Optical Network

Cascaded split architecture distributes optical splitters across multiple stages, often using 1x4 or 1x8 splitters in

In a PON network, a device called an optical line terminal (OLT) is placed at the head end of the network. A single fiber-optic cable

Instead of running fiber from the central office/ headend to every home like in a P2P arrangement, which is extremely expensive,

In this guide, you'll learn how fiber splitters function in PON networks, the difference between PLC and FBT types, and

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What's an optical splitter? How does the fiber optic splitter work? How many fiber splitter types? How to choose the

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explains how optical splitters enable FTTH, their types (FBT vs. PLC), key ratios, and how they integrate with LINK

This guide focuses on two critical aspects of optical splitters that define FTTH performance: split ratios (how signals

Unearth in-depth insights into FTTH Network Design. Learn about the critical role of optical splitters, understand

Optical splitter is one of the most important passive components in optical fiber links and plays an important role in

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FTTH currently developed very fast in South America and Africa, however, many new comers are

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