How to use a gigabit network optical splitter



Overview

These various methods can be mixed in a network to best meet the performance and cost requirements for the network.

Key Takeaways

An optical splitter passively divides a single fiber signal to multiple endpoints, which are then converted to Ethernet via ONTs before connecting to a gigabit switch. How Optical Splitters Work in a NetworkAn optical splitter is a passive device that splits a single optical signal from an Optical Line Terminal (OLT) into multiple outputs for Optical Network Terminals (ONTs) at user locations, allowing one fiber to serve multiple endpoints without active electronics. Splitters operate without power, making them cost-efficient and scalable, and are commonly used in GPON or PON networks for fiber-to-the-home (FTTH) or fiber-to-the-office (FTTO) deployments.

Connection to Gigabit SwitchesOLT to Splitter: The OLT sends optical signals through a fiber to the splitter. The splitter divides the signal according to its split ratio (e.g., 1: 8, 1: 32), distributing bandwidth among multiple ONTs.

Splitter to ON

T: Each output from the splitter connects to an ONT or ONU at the user premises.

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The ON

T converts the optical signal into electrical Ethernet signals compatible with standard network devices.

ON

T to Gigabit Switch: The ONT's Ethernet port is then connected to a gigabit switch using standard Cat5e or Cat6 cables. This allows multiple devices to access the network at gigabit speeds, depending on the ONT's capacity and the split ratio.

Considerations for Gigabit Performance

Split Ratio Impact: Higher split ratios reduce the optical power per ONT, which can affect throughput if the network is heavily loaded. For gigabit speeds, ensure the splitter and ONTs support sufficient bandwidth. Distance and Loss Budget: Optical signals degrade over distance.

Typical PO

N deployments cover 20–30 km, and the splitter's insertion loss must be accounted for to maintain reliable gigabit connectivity. Splitter Type: FBT (Fused Biconical Taper) splitters are cost-effective for small splits, while PLC (Planar Lightwave Circuit) splitters provide uniform performance for larger splits like 1: 32 or 1: 64. Passive Operation: Since splitters are passive, they do not require power or active management, but the ONT must be powered to convert optical signals to Ethernet.

Summary

To connect an optical splitter to a gigabit switch, the signal path is OLT → optical splitter → ONT → gigabit switch. The splitter passively divides the optical signal, the ONT converts it to Ethernet, and the switch distributes it to devices. Proper selection of split ratio, splitter type, and ONT capabilities ensures reliable gigabit performance across the network.

Article Content

Ultimate Guide to Optical Splitters for FTTH & GPON

Whether you are designing a GPON network, planning an Optical Distribution Network (ODN), or selecting components for a new FTTx deployment, understanding optical splitters is

Introduction to Passive Optical Network Splitter Architectures

These various methods can be mixed in a network to best meet the performance and cost requirements for the network. The next document to be published on this topic will be a more comprehensive look

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GPON Splitter Strategies: Optimizing Fiber Network

However, choosing the right GPON splitter strategy is crucial for performance, cost-effectiveness, and scalability. This blog explores different

Fiber Optic Splitters for PON Networks: 2025 Guide

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

Optical Splitters in PON Networks | FTTH Guide

Learn how optical splitters are used in PON networks, including centralized and cascaded FTTH deployment strategies and key factors.

Optical Splitters: Split Ratios, Splitting Architectures & PON Network ...

This guide focuses on two critical aspects of optical splitters that define FTTH performance: split ratios (how signals are divided) and splitting architectures (how splitters are

How to Use Optical Couplers and Splitters in Fiber Networks

Optical coupler and splitter guide: split or combine fiber signals, choose the right device, and optimize your fiber network for reliable performance.

Expand Your Fiber Optic Network Easily with Optical Splitters

In this video, we''ll introduce you to passive optical splitters, a simple yet powerful tool for scalable and cost-effective fiber network expansion.

Understanding Splitter Types in GPON Networks

Optical splitters are the silent workhorses of GPON networks. They enable mass FTTH deployment, reduce operational complexity, and unlock scalable broadband access.

Network Fibre Optics: How Modern Optical Networks Work

PON (Passive Optical Network) architectures use optical splitters to share a single fibre among multiple users, typically 32 or 64 premises per fibre. GPON (2.5 Gbps downstream) became

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The Cisco® 40GBASE QSFP (Quad Small Form-Factor Pluggable) portfolio offers customers a wide variety of high-density and low-power 40 Gigabit Ethernet connectivity options for

How to Repair Fiber Optic Cable: A Comprehensive Guide

This blog shares the common causes of fiber optic issues and provides detailed solutions on how to repair fiber optic cable.

Cables, Adapters, & Docking Stations: USB4, USB-C,

Cable Matters provides a large selection of innovative cables and accessories, we also educate consumers on the best product offerings. USB4, USB C,

Fibre Optic Network Design Principles – Wray Castle

Introduction to fibre optic network design Fibre optic network design is the structured engineering process of planning how optical fiber infrastructure connects buildings, campuses, cities,

Ubiquiti UFiber Gigabit Passive Optical Network Splitter 1:16, For Use ...

Product Details Ubiquiti UFiber Gigabit Passive Optical Network Splitter 1:16 SKU: UF-SPLITTER-16 Description:The UFiber splitter carries data from a UFiber OLT''s long-haul cable and shares it with

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