

The optical splitter divides the network into two gigabit networks



Overview

Optical Splitters: Split Ratios, Splitting Architectures & PON Network. This guide focuses on two critical aspects of optical splitters that define FTTH.

Key Takeaways

An optical splitter passively divides a single optical signal into multiple outputs, enabling one network link to serve two or more gigabit networks, though each output shares the original bandwidth. How Optical Splitters Work

An optical splitter is a passive device that takes one optical input from an Optical Line Terminal (OLT) and splits it into multiple outputs for Optical Network Terminals (ONTs) at end-user locations. In your scenario, a splitter dividing the network into two outputs effectively creates two separate gigabit networks, each receiving a portion of the original signal. The splitter does not require power and introduces minimal latency, but it does cause optical loss, which must be accounted for in the network design.

Split Ratios and Bandwidth

Splitters are characterized by their split ratio, such as 1:2, 1:4, 1:8, etc. A 1:2 splitter divides the signal into two outputs, each theoretically capable of supporting up to 1 Gbps if the OLT provides sufficient bandwidth. However, the total bandwidth from the OLT is shared, so careful planning ensures that each output maintains the desired gigabit performance.

Splitter Types

- PLC (Planar Lightwave Circuit) splitters: Highly uniform, ideal for precise bandwidth distribution, especially in larger splits .
- FBT (Fused Biconical Taper) splitters: Lower cost, suitable for small splits like 1:2 or 1:4, but less uniform in power distribution .

Deployment Architectures

- Centralized splitting: A single splitter is located near the OLT, distributing signals to multiple endpoints. Easier to manage but may require longer fiber runs and higher optical loss .
- Distributed splitting: Uses cascaded splitters closer to end-users, reducing fiber usage and signal loss, but more complex to manage .

Practical Considerations

When dividing a network into two gigabit networks using a splitter:

- Ensure the OLT port supports sufficient bandwidth for both outputs.
- Account for optical loss introduced by the splitter and fiber distance.
- Choose the appropriate splitter type (PLC for uniformity, FBT for cost efficiency).
- Decide on centralized or distributed architecture based on network layout and scalability . In summary, an optical splitter can effectively create two gigabit networks from a single fiber link, but the shared bandwidth and optical loss must be carefully managed to maintain network performance.

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

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