Does the optical splitter output the same IP address



Overview

Balanced (2xN) splitters consists of 2 input fibers and N output fibers which divide the power of the optical signal proportionally.

Key Takeaways

No, an optical splitter does not share the same IP address; each connected device receives its own IP from the network.How Optical Splitters Work

An optical splitter is a passive device that divides a single optical signal from an Optical Line Terminal (OLT) into multiple outputs for Optical Network Terminals (ONTs) at users' premises . It operates purely at the physical layer, splitting light signals without any processing or network intelligence. Common split ratios include 1:8, 1:16, 1:32, or 1:64, meaning one input fiber can serve multiple endpoints . The splitter itself does not assign IP addresses or manage network traffic.

IP Address Assignment in PON Networks

In a Passive Optical Network (PON), IP addresses are assigned to each ONT individually by the service provider's network, typically via DHCP or static configuration. Even though multiple ONTs share the same feeder fiber through a splitter, each ONT functions as a separate network device with its own unique IP address . The splitter merely allows multiple ONTs to receive the optical signal from a single OLT port, but it does not merge or duplicate IP addresses.

Key Points
• Passive operation: Splitters do not have electronics or software to manage IPs .

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• Bandwidth sharing: While the optical power is divided among outputs, each ONT still communicates independently with the OLT .

• Network transparency: The splitter is invisible to higher network layers; IP addressing, routing, and authentication are handled by the OLT and the service provider's network.

• Scalability: Adding more ONTs to a splitter does not change IP assignment; each new ONT receives a unique IP . In summary, optical splitters only split the light signal physically. Each connected ONT or subscriber device maintains its own IP address, ensuring proper network communication and management.

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