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Switch optical modules and OLT optical modules



Overview

An optical line termination (OLT), also called an optical line terminal, is a device which serves as the service provider endpoint of a. It provides two main functions: 1. to perform conversion between the electrical signals used by the service provider's equipment and the signals used by the passive optical network.

Key Takeaways

OLT optical modules are designed for PON access networks with point-to-multipoint communication, while switch optical modules are optimized for Ethernet point-to-point connections within LANs or data centers.Key Differences

1. Function and Network Role

• OLT Modules: Used in Optical Line Terminals to connect service provider networks to multiple end users via Passive Optical Networks (PONs). They handle point-to-multipoint communication, managing data transmission to multiple ONUs/ONTs through passive splitters, and support PON-specific protocols like GPON, EPON, XG-PON, or 10G-EPON .

• Switch Modules: Used in Ethernet switches to connect servers, routers, or other switches. They support point-to-point communication and are optimized for high-speed data transfer within LANs or data centers, often supporting link aggregation and stacking configurations . 2. Protocols and Standards

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• OLT SFP Modules: Support PON protocols with downstream/upstream speeds such as 2.5Gbps/1.25Gbps for GPON, or higher for XG-PON and 10G-EPON .

• Switch SFP Modules: Support Ethernet protocols, including 1G, 2.5G, 10G, and higher speeds, designed for multi-mode or single-mode fiber connections over varying distances . 3. Module Types and Packaging

• OLT Modules: Include SFP/SFP+ for low-density deployments, XFP for 10G PON, and QSFP28 for future 25G/50G PON evolution .

• Switch Modules: Include SFP 1G, SFP 2.5G, and SFP+ 10G, with distances ranging from 2 km (multi-mode) to 120 km (single-mode) depending on fiber type . 4. Technical Considerations

• OLT Modules: Require Tx/Rx wavelength swapping for PON operation, tunable wavelengths, and dynamic bandwidth allocation. Compatibility with GPON/EPON protocols is critical .

• Switch Modules: Focus on Ethernet data transmission, with parameters like Tx power, receiver sensitivity, and support for CWDM/DWDM wavelengths for longer distances or high-density deployments . 5. Interoperability

• Switch SFPs can only be used in OLTs if they support PON protocols and meet OLT Tx power requirements. Using incompatible modules can lead to network failures . Summary

In essence, OLT optical modules are specialized for access networks with multiple end users, supporting PON protocols and long-distance transmission, while switch optical modules are designed for high-speed Ethernet connections within enterprise or data center networks. Understanding these differences is crucial for proper network design, module selection, and ensuring compatibility across devices .

Article Content

Optical line termination

An optical line termination (OLT), also called an optical line terminal, is a device which serves as the service provider endpoint of a passive optical network. It provides two main functions: 1. to perform conversion between the electrical signals used by the service provider''s equipment and the fiber optic signals used by the passive optical network.

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