

Article Overview

A 10G PON port provides symmetrical 10 Gbps optical connectivity over a passive fiber network, supporting high-speed broadband for residential, business, and enterprise applications.

Overview

A 10 Gigabit Passive Optical Network (10G PON) port is part of a fiber-optic access network that delivers high-speed broadband using a point-to-multipoint architecture. Unlike traditional point-to-point fiber, a single optical fiber from the central office (OLT) is shared among multiple subscribers through passive splitters, eliminating the need for powered equipment in the distribution network and reducing operational costs and complexity .

Standards and Technology

The most common 10G PON standard is XGS-PON, defined by the ITU-T G.9807.1 specification. It provides symmetrical 10 Gbps downstream and upstream speeds, compared to GPON's 2.4 Gbps downstream and 1.2 Gbps upstream . The ITU-T G.987.3 recommendation defines the transmission convergence layer for 10G-capable PON systems, ensuring interoperability, service encapsulation, and efficient bandwidth allocation . XGS-PON uses wavelength-division multiplexing (WDM) to separate upstream and downstream traffic on a single fiber. Typical wavelengths are 1577 nm downstream and 1270 nm upstream, distinct from GPON wavelengths, allowing coexistence of 10G and legacy GPON services on the same optical distribution network .

Components

- o Optical Line Terminal (OLT): Located at the service provider's central office, it manages multiple 10G PON ports and coordinates upstream traffic using time-division multiple access (TDMA).
- o Optical Network Terminal (ONT) or Optical Network Unit (ONU): Installed at the subscriber premises, it terminates the optical signal and provides Ethernet or routed interfaces for end devices. Cisco's 10G Routed PON ONTs integrate XGS-PON optics, MAC, and Ethernet switching, optimizing cost and footprint for residential, MDU, SOHO, and SMB deployments .
- o Passive Splitters: Distribute the optical signal to multiple ONTs without requiring power, typically serving 16-64 subscribers per fiber feeder .

Advantages

- o High bandwidth: Symmetrical 10 Gbps supports demanding applications like 4K/8K streaming, cloud services, and enterprise connectivity.

10 Gigabit Passive Optical Network Port

- o Cost efficiency: Passive distribution reduces power and maintenance costs.
- o Scalability: Supports dense deployments with minimal infrastructure changes.
- o Coexistence: Can operate alongside GPON networks using separate wavelengths, enabling gradual upgrades

Deployment Considerations

When deploying a 10G PON port, operators must consider:

- o Optical budget and reach: Extended power classes allow longer distances and higher split ratios.
- o Compatibility: Ensure ONTs and OLTs support XGS-PON and coexistence with existing GPON networks.
- o Network management: Integrated routing and switching in ONTs can reduce edge transport costs and simplify service provisioning . In summary, a 10G PON port is a high-performance, cost-effective solution for modern fiber-to-the-premises networks, providing symmetrical 10 Gbps connectivity with passive optical distribution, supporting both current and future broadband demands.

With the increasing demand from users for higher bandwidth, new generations of PON technology such as XG-PON

A broad range of industry-compliant SFP+ modules for 10 Gigabit Ethernet deployments in diverse networking

To provide a path for higher performance in Passive Optical Networks succeeding the 2.4Gbps / 1.2Gbps GPON implementation, 10

10G PON (10 Gigabit Passive Optical Network) refers to a passive optical network with fiber link transmission speeds

The proposed architecture consists of a 10-gigabit-capable passive optical network (XG-PON) in the network

What is 10G PON 10G PON (10 Gigabit Passive Optical Network) is a next-generation fiber-optic broadband

The 10 Gbit/s Ethernet Passive Optical Network standard, better known as 10G-EPON allows computer network connections over

Hier sollte eine Beschreibung angezeigt werden, diese Seite lässt dies jedoch nicht zu.

10G PON is an advanced fiber optic technology providing speeds up to 10 Gbps, including

10 Gigabit Passive Optical Network Port

GPON (Gigabit-Capable Passive Optical Network) is an ITU standard (ITU G.984) that can support up to 2.5 Gbps shared bandwidth

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In this use, a PON has a point-to-multipoint topology in which an ISP uses a single device to serve many

Here's how GPON networks are designed: The main optical transmitter, called the OLT

This document describes the Gigabit Passive Optical Network (GPON) technology and how it functions.

10 Gigabit Ethernet Router with two dozen 10 Gigabit Ethernet ports and three types of physical-layer module
10 Gigabit Ethernet

A Gigabit Passive Optical Network (GPON) is a telecommunications technology that uses fiber-optic cables to deliver high-speed

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