Passive optical networks PONs are classified into several types

Overview

Explore all major types of PON—GPON, XGS-PON, 25G, 50G PON & more. Compare specs, use cases, and choose the right PON for next-gen fiber networks.

Key Takeaways

Passive Optical Networks (PONs) include APON, BPON, GPON, XGS-PON, 10G-PON, 25G-PON, 50G-PON, and emerging coherent PON (CPON) standards.

Legacy PO

N StandardsAPON (ATM PON): The first generation of PONs standardized under ITU-T G. 983, using Asynchronous Transfer Mode (ATM) for data transmission.

APO

N typically provided 622 Mbps downstream and 155 Mbps upstream and was mainly used for early fiber-to-the-home (FTTH) deployments.

BPO

N (Broadband PON): An evolution of APON, also under ITU-T G. 983, supporting higher bandwidth and additional features like dynamic bandwidth allocation.

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BPO

N maintained compatibility with ATM but gradually shifted toward Ethernet-based services. Widely Deployed Modern PONsGPON (Gigabit PON): The most widely deployed PON standard globally, delivering 2. 5 Gbps downstream and 1.

25 Gbps upstream with split ratios up to 1: 128.

GPO

N supports triple-play services (data, voice, video) and is commonly used in residential and enterprise FTTH deployments. XGS-PON (10 Gigabit Symmetrical PON): Provides 10 Gbps symmetrical speeds, making it suitable for environments with heavy upstream traffic, such as cloud-connected healthcare systems or large enterprise campuses. 10G-PON: Includes 10G-EPON and 10G-GPON variants, offering 10 Gbps downstream and 1–10 Gbps upstream, often used in high-demand residential or business networks.

Emerging High-

Speed PONs25G-PON and 50G-PON: Newer standards designed for carrier and data center environments, providing 25 Gbps or 50 Gbps bandwidth to meet future high-capacity demands.

CPO

N (Coherent PON): Developed by CableLabs, CPON uses coherent optical technology to achieve 100 Gbps symmetrical speeds with split ratios up to 1: 512, requiring only a single wavelength of light. SummaryPON types can be categorized by generation and speed: First-generation: APON, BPON (legacy, ATM-based or early broadband)Second-generation: GPON, 10G-PON, XGS-PON (widely deployed, Ethernet-based)Next-generation: 25G-PON, 50G-PON, CPON (high-speed, carrier-grade, and data center applications) Each PON type differs in bandwidth, split ratio, and deployment scenario, allowing service providers to select the appropriate technology based on user density, traffic demand, and future scalability.

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Article Content

What Is Passive Optical Networking (PON)?

While PON was initially focused on fiber connectivity to the home, other types of network users–such as hotels, hospitals, and high-density residential buildings–are now seeing similar advantages in "last

Understanding Types of PON: An In-Depth Exploration of Passive

Explore all major types of PON—GPON, XGS-PON, 25G, 50G PON & more. Compare specs, use cases, and choose the right PON for next-gen fiber networks.

Passive Optical Networks: An intro to xPON

What is a Passive Optical Network? A Passive Optical Network (PON) is a fiber-optic network that uses passive splitters to deliver data from a single optical fiber to multiple endpoints,

What are the Different Types of Passive Optical Networks (PONs)?

Passive Optical Networks continue to evolve to meet the increasing demand for bandwidth and connectivity. From GPON and EPON to advanced technologies like XGS-PON and NG-PON2, each

What Is a Passive Optical Network (PON)?

The system comprises three main components: the Optical Line Terminal (OLT) at the service provider''s end, Optical Network Units/Terminals (ONUs/ONTs) at the user end, and the

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Comprehensive guide to Passive Optical Network (PON) technology, covering GPON, EPON, XGS-PON, NG-PON2, and future 50G/100G standards. Learn PON architecture,

Passive Optical Networks

A passive optical network (PON) is defined as a point-to-multipoint communication architecture that utilizes a single optical fiber split among multiple endpoints, allowing for increased bandwidth and

Passive Optical Networks (PONs)

PON variants are described, including GPON, EPON, APON, BPON, XG-PON, and FSAN. Upstream and downstream access technologies are discussed, including TDMA and WDMA. Wavelength

PON for Dummies: Understanding Passive Optical Networks

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What Makes PON Different than Other Network Architectures? A passive optical network (PON) is a point-to-multipoint fiber network architecture that uses optical splitters to deliver high-bandwidth

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Two types of systems enable fiber optic cables to transmit data using light and make FTTH possible: active optical networks (AONs) and passive optical networks (PONs).

The FOA Reference For Fiber Optics

Fiber To The Home Network Design There is really no way to generalize on the design process for fiber to the home (FTTH) networks - or any fiber optic network

Cost Minimization Planning for Passive Optical Networks

Today, passive optical networks (PONs) represent a modern solution for high-speed FTTx subscriber lines and networks. Due to the fact that optical fibres and cables are deployed in last

What Is a Passive Optical Network

Users also see multiple benefits from a passive optical network. The most obvious is the fast speeds for data transfer. Additionally, PONs can supply

What Is Passive Optical Networking (PON)?

Passive optical networking (PON), like active optical networking, uses fiber-optic cabling to provide Ethernet connectivity from a main data source to endpoints. While there are many subtle differences,

Passive Optical Networks (PONs): Past, present, and future

Passive Optical Networks (PONs) have been the focus of considerable research, development, and standardization efforts over recent years. Today, they are well positioned as the

Understanding Passive Optical Networks (PONs): Key Concepts and ...

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Passive Optical Networks Progress: A Tutorial

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For many years, passive optical networks (PONs) have received a considerable amount of attraction regarding their potential for providing broadband connectivity to almost every citizen,

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