

Article Overview

Passive Optical Network (PON) technologies are widely patented, covering systems, devices, and methods for efficient fiber-optic broadband delivery and integration with advanced networking standards.

Overview of PON Patents

PON patents cover a range of technologies for delivering broadband access using fiber-optic networks with passive splitters to serve multiple endpoints from a single optical fiber. These patents often focus on Fiber-to-the-Home (FTTH) systems, optical line terminals (OLTs), optical network terminals (ONTs), and optical network units (ONUs) that manage upstream and downstream data transmission efficiently .

Key Patent Examples

- o Daisy-Chaining in Optical LANs U.S. Patent Application US20150263810 describes a system where an ONT receives an optical signal from an OLT, splits it, and forwards a portion to another ONT, enabling daisy-chaining of devices in a local area network. This approach optimizes resource usage and reduces infrastructure costs .
- o Time-Sensitive Networking Integration Patent WO/2025/137746 focuses on integrating PON components with Time-Sensitive Networking (TSN). It abstracts PON links to function as TSN bridges, implementing advanced time synchronization and traffic scheduling to ensure quality of service (QoS) for time-sensitive communications .
- o Upstream Data Burst Management U.S. Patent Application 20250062851 describes a PON ONU with a transmitter subsystem that is enabled only during assigned timeslots for upstream data bursts. This method improves bandwidth allocation and reduces collisions in multi-user environments .

Applications and Innovations

- o FTTH Multimedia Access: Patents cover systems that transport voice, video, and data signals over PONs, using optical multiplexing to combine multiple wavelengths for efficient delivery to subscriber home units .
- o Optical Splitter and Transceiver Designs: Innovations include integrated optical splitters within ONTs and ONUs to manage signal distribution and forwarding efficiently .
- o Network Management and QoS: Patents address dynamic configuration of network flows, centralized control, and integration with emerging standards to optimize performance in residential and enterprise networks .
- o Commercial and Regulatory Optimization: Some patents focus on minimizing infrastructure costs and meeting strict regulatory requirements for network deployment .

Patent Resources

Passive Optical Network Patents

- o PatSnap Eureka provides a searchable database for PON patents, prior art, and freedom-to-operate assessments .
 - o NEC Labs America maintains a portfolio of optical networking patents spanning backbone to home networks .
 - o PatentBuddy and Google Patents offer detailed patent applications and family data for PON technologies .
- These patents collectively demonstrate the breadth of innovation in PON systems, from hardware design to network management and integration with advanced networking protocols.

Some liken the role of optical fiber networks in today's high-speed networks to that of engines in high-speed cars. A

This page includes the patent name, patent number, legal status, invention/applicant, technical efficacy and accompanying drawings

Optical access solutions have attracted the attention of researchers from both academia and industry for a long time. In

Featured Application: In this study, the researchers have constructed a technology network model to explore the development of key

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Our Optical Networking & Sensing department develops new optics and photonics patents spanning the Internet

In order to offer end users an efficient multi-service access, it is necessary to implement high quality network access.

A passive optical network (PON) with low cost and high capacity has been explored and recommended for supporting the emerged

Passive optical network (PON) research and technology have matured in recent years and firmly established PONs as

Given that technologies disclosed by standard essential patents (SEPs) are the key technologies that determine the

Passive optical network (PON) is continuously explored for new architectures and effective DSP techniques to

adapt to the next

Since 2001, he has been with the NTT Access Network Service Systems Laboratories, Chiba, Japan, and working on research and

Referring to FIG. 40, a passive optical network may include a plurality of optical line terminals (OLTs) that are

Passive optical network A fiber optic cable assembly with SC APC connectors, as commonly used to link

Abstract and Figures This paper presents a comprehensive overview of the emerging coherent passive optical network

Passive optical networks (PONs) are telecommunication networks that provide services to users by no active

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