

800G EPON Equipment Selection Guide for Local Area Networks



Overview

EPON Network Planning & Deployment Guide A comprehensive guide to EPON network planning and deployment, covering network architecture design, OLT and Selec.

Key Takeaways

Selecting 800G EPON equipment requires careful consideration of OLT/ONU types, optical splitters, transceiver modules, and network topology to ensure high-speed, reliable LAN performance.

Core EPON Components

An EPON network consists of three main components: the Optical Line Terminal (OLT) at the central office, Optical Network Units (ONUs) at subscriber premises, and the Optical Distribution Network (ODN) connecting them . The OLT manages bandwidth allocation, data scheduling, and network management, supporting multiple PON ports, each connecting to multiple ONUs through passive optical splitters . ONUs vary by deployment scenario: SFU for single-family homes, HGU with routing/WiFi for residential broadband, MDU for multi-dwelling units, and SBU for small businesses .

Optical Splitters and ODN Considerations

Optical splitters are critical passive components that distribute signals from the OLT to multiple ONUs. Key parameters include: split ratio (1:8, 1:16, 1:32, 1:64), operating wavelength (1310nm upstream, 1490nm downstream), insertion loss (e.g., 1:32 $\approx$ 16.5–17.5 dB), and package type (plug-in, tray, or mini). The optical power budget—including OLT transmit power, splitter loss, fiber loss, connector loss, and ONU receiver sensitivity—directly affects network coverage and stability.

800G Transceiver Modules

For high-speed LAN backbones or aggregation layers, 800G OSFP transceiver modules provide flexible connectivity options: 800GE, 2x400GE, 4x200GE, and 8x100GE. These modules comply with IEEE 802.3 standards and the OSFP MSA, offering high port density and interoperability with other 100GE, 200GE, and 400GE interfaces. They are suitable for data centers, enterprise core/distribution layers, and service provider networks, supporting both front-end and back-end AI or high-performance computing applications.

Selection Criteria

When selecting 800G EPON equipment for LANs, consider the following:

- Port Types and Counts: GE/FE, POTS voice ports, CATV RF interfaces, and high-speed 800G ports for aggregation.
- Standard Compliance: IEEE 802.3ah/av for EPON, OSFP MSA for 800G transceivers.
- Management Methods: OMCI, TR-069, and Ethernet OAM for monitoring and configuration.
- Operating Environment: Temperature range, EMI resistance, and reliability requirements.
- Network Topology: Split ratios, fiber lengths, and optical power budget to ensure coverage and signal integrity.

Deployment Recommendations

- Use MDU or SBU ONUs for multi-user or enterprise environments to maximize port utilization.
- Choose split ratios based on subscriber density and optical budget; lower split ratios reduce insertion loss and improve signal quality.
- Deploy 800G OSFP modules in aggregation or core switches to future-proof LAN infrastructure and support high-bandwidth applications.
- Ensure compatibility between OLT, ONU, and transceivers to maintain network stability and simplify management.

By carefully evaluating these factors, network designers can build high-performance, scalable 800G EPON LANs that meet both current and future bandwidth demands.

Article Content

How to Choose the Right Fiber Cabling Solution for 800G Networks

This article introduces the key factors that influence 800G fiber cabling selection, compares three mainstream

Juniper 800G Optical Transceivers and Cables Guide

Use this guide to learn about the Juniper Networks® 800G optical transceivers and cables, their specifications, and

2026 PON Evolution Guide: EPON, GPON, XGS-PON and 10G-EPON – network ...

Learn how PON evolved from APON/BPON to EPON, GPON, XGS-PON and 10G-EPON, and how to choose right

A Comprehensive Guide to 800G Ethernet DAC Cables

This guide systematically analyzes the definition, direct connection and branching forms, application scenarios and

GPON vs EPON vs XGS-PON Comparison: Specs and Selection Guide

Complete comparison guide of GPON, EPON and XGS-PON fiber access technologies. Covers technology

Ethernet Passive Optical Networks

Definition Ethernet passive optical networks (EPON) are an emerging access network technology that provides a low-cost method of

EPON vs GPON: The Ultimate Guide to Your Fiber Optic Network

GPON vs EPON: Compare speeds, user capacity, cost, and Ethernet compatibility to choose the best fiber network

How to Choose Between EPON and GPON: A Strategic Guide for Network ...

As fiber networks become the backbone of modern digital infrastructure, selecting the right PON (Passive Optical

Next Generation Ethernet Passive Optical Network (NG-EPON)

The activity will generate a report which will detail: (a) operators' requirements, (b) technological and economic tradeoffs of various

A Comprehensive Guide to 800G Ethernet DAC Cables

800G Ethernet DAC cables, as a direct-connection solution based on high-speed copper cabling, are widely used in

MPO Data Center Guide: Fiber Cabling for 40G to 800G Networks

The complete framework for MPO infrastructure deployment at data centers is provided in this guide, which covers all

A Comprehensive Guide to GPON and EPON Technologies in PON Networks

Combining the strengths of PON and Ethernet technologies, EPON features low cost, high bandwidth, scalability,

Juniper 800G Optical Transceivers and Cables Guide | Juniper Networks

Use this guide to learn about the Juniper Networks® 800G optical transceivers and cables, their specifications, and how to install,

800G Ethernet Technical Specification | PDF | Networking ...

The document outlines the 800G Ethernet Specification developed by the Ethernet Technology Consortium, detailing its architecture,

Understanding EPON vs GPON: Which One Fits Your Network?

EPON and GPON are two leading PON technologies used in fiber networks. EPON offers cost-effective, symmetrical

10G to 800G Cabling Guide For DELL Optical Transceivers

This Cabling Guide will discuss the different available fiber optic connectivity to work with 10G, 25G, 40G, 100G, 200G, 400G and

Extreme Networks Transceiver Solutions: Selection Guide for 800G ...

Complete guide to Extreme Networks 800G transceiver solutions: optical link budget calculation, DDM monitoring

1.6T Optical Transceiver Roadmap for Future Data Centers

Discover what 1.6T optical transceivers are, how they fit AI data centers, and how to choose the right form factor, reach, vendor, and

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

