

## 1G Selection Guide for GPON Equipment in IDC Data Centers



### Overview

Selection Guide for Upgraded Equipment for Data Center Use By mapping generic OLT/ONU selection criteria onto PON-specific considerations, you can confidently

### Key Takeaways

Selecting 1G GPON equipment for IDC deployments requires careful consideration of OLT port density, ONT/ONU capabilities, scalability, redundancy, and management features to ensure high-performance, future-proof fiber access. Key Considerations for OLT Selection



1. Port Density and Scalability: Choose OLTs that can support the current and projected number of subscribers or endpoints. For IDC environments, modular chassis-based OLTs are preferred for flexibility, allowing expansion as user density grows, while compact all-in-one units may suit smaller deployments. Each PON port typically supports up to 128 ONTs, but split ratios and growth plans should guide the selection.

2. Bandwidth and Standards: Standard GPON provides 2.5 Gbps downstream and 1.25 Gbps upstream, sufficient for 1G services. Ensure the OLT supports ITU-T G.984.x standards for GPON and optionally G.9807.1 for XGS-PON if future upgrades are planned. Consider symmetric XGS-PON for higher throughput and enterprise-grade applications.

3. Redundancy and Reliability: For data center deployments, power redundancy, hot-swappable modules, and failover capabilities are critical to avoid single points of failure. Redundant OLTs or dual-homing ONTs can maintain service continuity.

4. Management and Integration: OLTs should support OMCI (ONT Management Control Interface), SNMP, and centralized management platforms for monitoring, provisioning, and firmware updates. Integration with billing, authentication (PPPoE/RADIUS), and QoS enforcement is essential for enterprise-grade service delivery.

#### ONT/ONU Selection

1. Interface Requirements: ONTs must provide sufficient Ethernet ports (1–4 GE for standard 1G deployments) and optional features like FXS for voice, Wi-Fi, or routing capabilities depending on the IDC's internal network needs. For high-density or enterprise scenarios, consider ONTs with advanced VLAN, QoS, and secure management features.

2. Compatibility and Coexistence: Ensure ONTs are compatible with the chosen OLT and support coexistence with future XGS-PON upgrades. This allows smooth migration without replacing the entire fiber infrastructure.

3. Deployment Form Factor: Rack-mounted or DIN-rail mountable ONTs are suitable for IDC environments, providing organized installation and easier maintenance.

#### Deployment Topology and Split Ratios

1. Centralized vs Distributed: Decide between centralized OLTs in the main data center or distributed OLTs closer to high-density racks or floors. Centralized deployments simplify management, while distributed deployments reduce fiber length and improve latency.

2. Split Ratios: Typical GPON split ratios range from 1:16 to 1:32 for IDC deployments. Cascaded splitting (e.g., 1:4 then 1:8 = 1:32) allows staged investment and scalability as the number of endpoints grows.

#### Future-Proofing

Even for 1G services, consider OLTs and ONTs that support XGS-PON for 10G symmetric speeds. This ensures the network can scale to higher bandwidth demands without major infrastructure changes.

### Summary Checklist for IDC GPON Selection

- Estimate subscriber/endpoints and growth projections.
- Choose OLTs with sufficient port density, modularity, and redundancy.
- Ensure ONTs provide required Ethernet interfaces, VLAN, QoS, and management features.
- Plan split ratios and deployment topology for scalability and low latency.
- Verify standards compliance (GPON G.984.x, optional XGS-PON G.9807.1).
- Integrate management, monitoring, and authentication systems for operational efficiency. By following these guidelines, IDC operators can deploy a reliable, scalable, and future-ready 1G GPON network that meets current demands while allowing smooth upgrades to higher-speed PON technologies.

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### Optical Network Terminal (ONT) Selection Guide | GPON, XGS-PON

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## Selection Guide for Upgraded Equipment for Data Center Use

Compare GPON, XGS-PON, enterprise and FTTR master ONTs with clear decision rules. ZION's ONT selection guide shows how

GPON hardware: your questions answered

However, many telecom operators and service providers have questions about GPON hardware, how it works and

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## Things You Must Know About Connecting to GPON

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## 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

## 2026 PON Evolution Guide: EPON, GPON, XGS-PON and 10G-EPON

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## Unlocking the Power of GPON: Your Ultimate Guide to High-Speed

The Role of Optical Modules in GPON Networks Optical modules, or transceivers, are critical in GPON systems,

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## GPON FTTH Network Setup Guide

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