

Reimagine Your Broadband Access Network for Agile and Differentiated Services



We have an insatiable demand for high-speed, high-quality connectivity, driven by:

- Immersive video streaming experiences in 8K and 12K
- AR, VR, and metaverse business-to-consumer applications
- Hybrid work with the need to collaborate seamlessly from home, office, or anywhere
- Enhanced business services with SD-WAN Service-Level Agreements (SLAs)

Service providers face the dual challenge of reliably scaling bandwidth while ensuring a strong return on their infrastructure investment.

In conjunction with an industry-leading access and aggregation routing portfolio, Cisco® Routed PON redefines the last mile by providing a scalable, reliable, and cost-effective solution for deploying Passive Optical Networking (PON).

Benefits

Cost efficiency: By integrating a pluggable PON Optical Line Terminal (OLT) directly into routers, Cisco Routed PON reduces power consumption and space requirements, lowering CapEx compared to traditional PON chassis solutions with a pay-as-you-grow model and enhancing scalability without requiring large upfront investments.

Universal access: Customers can generate additional revenue streams from multiple services on a single router, such as active Ethernet for business applications, cell site backhaul, and broadband services.

Scalability: The solution enables seamless bandwidth upgrades simply by plugging in a higher-speed PON OLT into the router as it becomes available, helping ensure future-ready investments without the need for extensive equipment changes.

Flexibility and choice: Cisco Routed PON interoperates with a wide range of Optical Network Terminals (ONTs) and Optical Network Units (ONUs) for various applications, helping ensure flexibility in deployments.

Simplified network management: With Layer 1/Layer 2/Layer 3 convergence, the solution lowers CapEx and streamlines operational management, offering a unified approach to managing different network layers.

Enhanced reliability: Cisco Routed PON with [Provider Connectivity Assurance](#) offers network observability and proactive troubleshooting. Achieve uninterrupted service and improve the customer experience by providing rapid, automated Layer 3 failover, minimizing downtime, and optimizing operational efficiency.

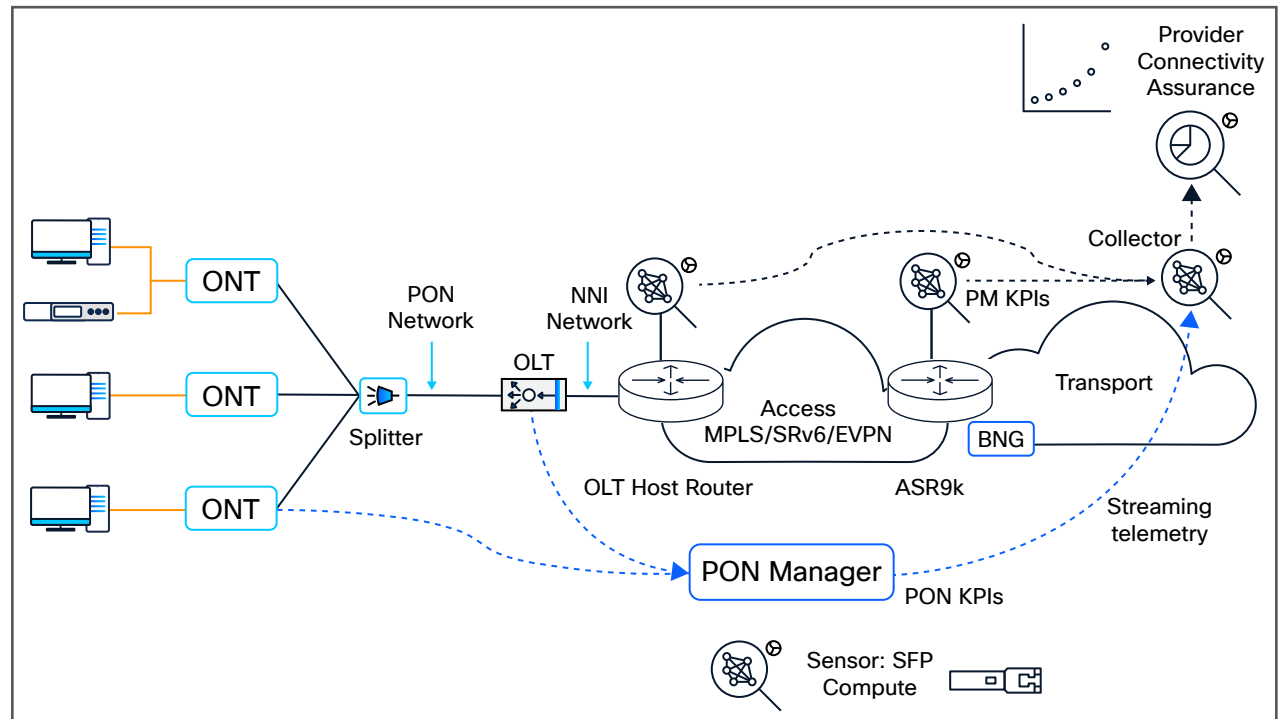


Figure 1. Cisco Routed PON architecture

The need for network transformation

Traditional access network architecture is difficult to fully monetize due to challenges related to vendor interoperability, rigid consumption models, siloed resources, and narrow service offerings:

- Vendor-proprietary interfaces and lock-in of ONT
- Challenges in achieving fill rate and return on dedicated infrastructure investment
- Resources only for broadband services, managed by a single Communications Service Provider (CSP)
- Monolithic operating systems and limited SLA differentiation

Solution: A software-defined access network architecture that enables new, innovative business models.

- Open interfaces with well-documented APIs and flexible ONTs help maximize choice and agility
- Pay-as-you-grow offers ease of capacity management and planning for different services
- Automation of infrastructure and end-to-end service provisioning enhances efficiency and reliability
- Network underlay with policy intent differentiates services based on subscriber experience

Cisco Routed PON components

OLT pluggables

- 10 Gigabit-capable Symmetrical PON (XGS-PON) OLT MAC bridge IC built into a Small Form-Factor Pluggable (SFP)
- Converge IP and optical networks onto a single layer

Optical network terminals

- A portfolio of enclosure ONTs is available, supporting 1, 2.5, and 10 Gigabit Ethernet (GE), Power over Ethernet (PoE), voice, and outdoor applications—enabling a complete, end-to-end XGS-PON solution.

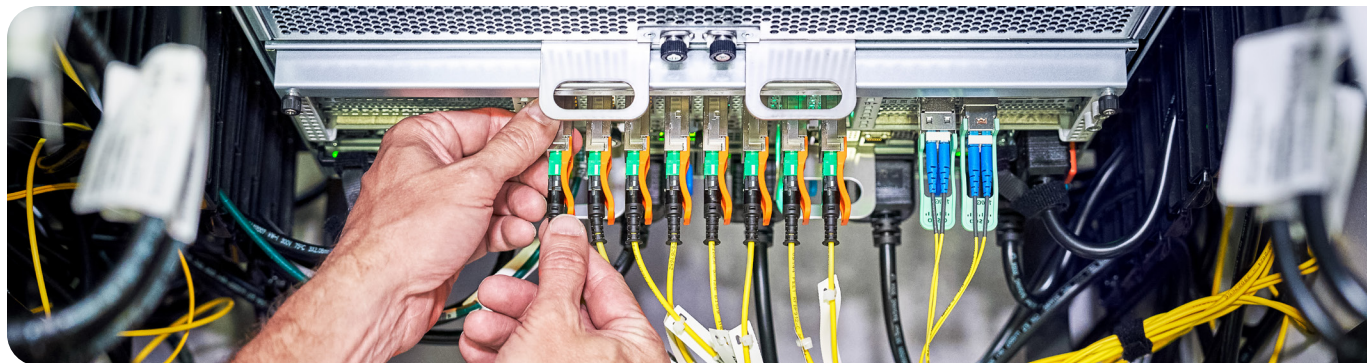
Routed PON Manager

- Manage the PON at scale from a centralized software platform with open APIs.

Access and aggregation routers (OLT host router)

- Converged-access Cisco Network Convergence System (NCS) 540 IOS XR router
- High-performance Cisco NCS 5700 and 5500 Series IOS XR aggregation routers
- Support for Cisco 8000 Series access and aggregation routers coming soon

The customer would determine their host routing platform, type and quantity of OLT pluggables, and type and quantity of ONTs (Cisco or other ONU Management and Control Interface (OMCI)-compliant vendor).



The Cisco advantage

Cisco is uniquely positioned to help you transform your access network. Only Cisco can help provide a disaggregated and flexible solution with deep network visibility and visualization to help ensure the highest-quality services to customers. Available solutions, including assurance, subscriber management, and Distributed Denial-of-Service (DDoS) edge protection, help Cisco Agile Services Networking provide a seamless end-to-end architecture for AI connectivity.

Learn how you can [enable agile and differentiated broadband services](#) with operational efficiency at scale as part of Cisco Agile Services Networking.

Use cases

Table 1. Use cases

Industry	Use case
Enterprise use case	<p>For business and enterprise, Routed PON delivers high-speed, symmetrical bandwidth for apps like cloud collaboration, VoIP, and security.</p> <p>MEF 3.0 compliance and Multiprotocol Label Switching (MPLS) support help ensure SLA-grade services for everyone—from startups to global enterprises.</p>
Residential use case	<p>For residential deployments, Routed PON offers affordable high-speed access for smart homes that scales.</p> <p>Think smart homes, video streaming, and home offices—all supported by validated ONTs that target a wider range of customer needs, including home furnishings with expanded Wi-Fi reach, and upgraded support for utilities, hospitality, and government agencies.</p>
Commercial use case	<p>For commercial deployments like resorts and hotels, Routed PON can support high bandwidth and scalable services like internet access, IPTV, security, and other IoT applications needing redundancy, low latency, and performance.</p>