# What optical module should be selected for the aggregation switch



## Overview

Optical module selection at the aggregation layer must account for higher bandwidth and longer transmission distances.

## Key Takeaways

Aggregation switches typically use 10G SFP+, 40G QSFP+, and 100G QSFP28 optical modules, with single-mode SFP+ modules recommended for longer distances.

### Common Optical Modules10

G SFP+ Modules: These are widely used for downlinks to access switches and uplinks to the core network. They support standards such as 10GBASE-SR (short-range, multimode fiber), 10GBASE-LR (long-range, single-mode fiber), and 10GBASE-ER (extended-range, single-mode fiber) to accommodate distances from a few hundred meters up to 40 km or more depending on the module type and fiber used. 40G QSFP+ Modules: Used in high-density aggregation scenarios, these modules aggregate multiple 10G links or provide high-speed uplinks to the core.

They are suitable for data center environments where multiple 10G or 25G connections need to be consolidated. 100G QSFP28 Modules: These modules are designed for ultra-high-speed aggregation, typically in large data centers or enterprise backbones. They support single-mode fiber for long-distance connections and can also be used with breakout cables to connect multiple lower-speed ports.

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Fiber Type and Distance ConsiderationsSingle-mode fiber (SMF): Recommended for aggregation switches when connecting across buildings or over distances exceeding 10 km. Modules like 10GBASE-LR or 10GBASE-ER are standard choices. Multimode fiber (MMF): Suitable for short-range connections, typically under 300 meters, using 10GBASE-SR modules.

### Additional Considerations

When selecting optical modules for aggregation switches, consider: Link Aggregation (LACP): Combining multiple physical links into a single logical link for higher bandwidth and redundancy. Port Density: Aggregation switches often have 24–48 downlink ports and 4–8 uplink ports, so module form factor and size (SFP+, QSFP+) are important for high-density deployments. Redundancy and Reliability: Dual power supplies, redundant engines, and support for protocols like VRRP/HSRP enhance network resilience.

Monitoring and Diagnostics: Many SFP/SFP+ modules support Digital Diagnostic Monitoring (DDM) to track temperature, voltage, and optical power, aiding in proactive maintenance. In summary, aggregation switches rely on modular optical transceivers such as 10G SFP+, 40G QSFP+, and 100G QSFP28, with single-mode fiber preferred for long-distance uplinks and multimode fiber for short-range connections. Proper selection ensures high throughput, redundancy, and scalability in enterprise and data center networks.

## Article Content

Access Layer vs Aggregation Layer Fiber Equipment Selection Guide

Optical module selection at the aggregation layer must account for higher bandwidth and longer transmission distances. Recommended options include: 10G SFP+ modules (10GBASE

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Learn how to select the ideal optical transceiver module based on speed, fiber type, compatibility, and real deployment scenarios. Includes expert recommendations and trusted Cisco

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Plug four 10G SFP+ optical modules into the 10-Gbps SFP+ ports of a fiber network switch, then insert a 40G QSFP+ optical module into the 40-Gbps QSFP+ port of the other fiber

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Defining switch aggregation and its role in network architecture Switch aggregation, also known as link aggregation or trunking, is a method

What Is an All-Optical Ethernet Switch?

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Which Aggregation Switch to Choose?

In-depth discussion of the key role and selection points of aggregation switches in network architecture, and comparison of their differences with core layer and access layer switches.

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Software Capabilities: CX308P-48Y-M: 25G Aggregation & Core Switch for Campus and Cloud-Edge Networks CX308P-48Y-N-V2: Powerful 25G Switch for Data Center Support ROCEv2 &

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