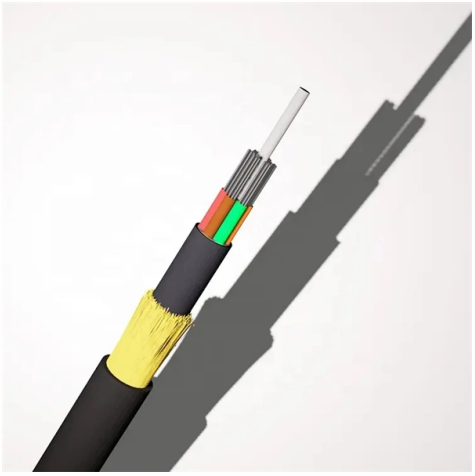
What optical modules are needed for stacking



Overview

To sum up, from the perspective of practicality and economy, DAC should be used for data transmission or switch stacking below 7 meters.

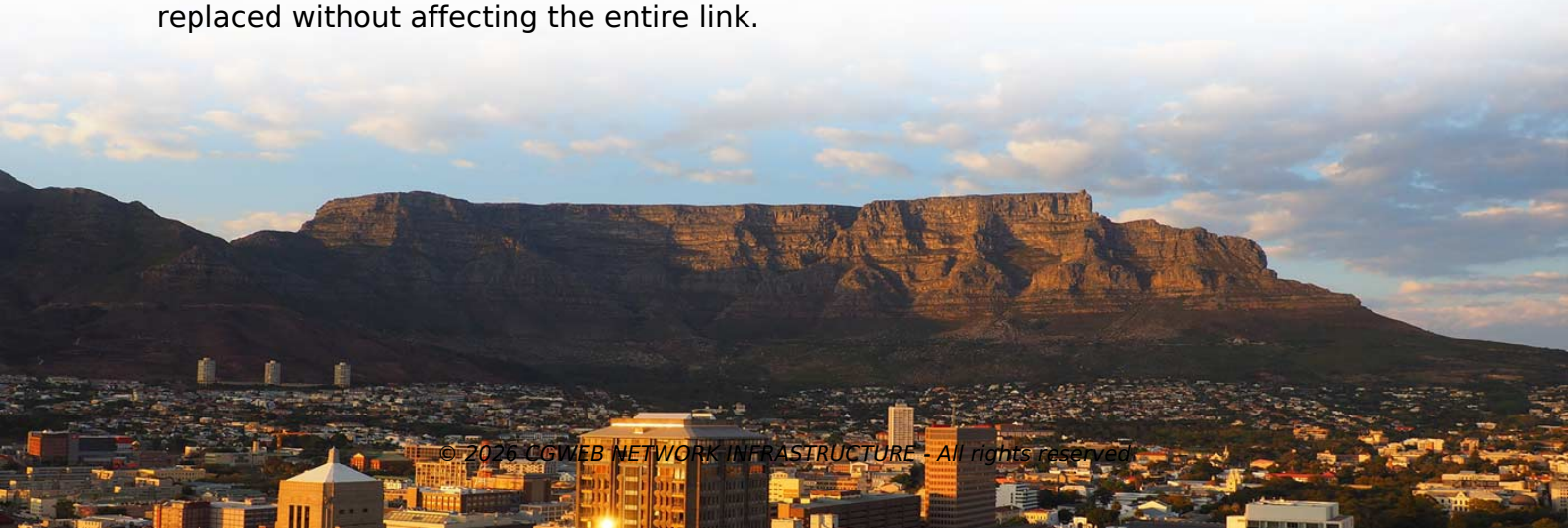
Key Takeaways

Yes, optical modules can be stacked, either through traditional switch stacking with fiber connections or via advanced co-packaged optics (CPO) integration.

Traditional Optical Module Stacking

In conventional networking setups, optical modules can be used to stack switches by connecting multiple devices into a single logical unit. Switch stacking allows one master switch to manage operations while other switches act as backups, ensuring high reliability and simplified network management. For short distances (under 7 meters), Direct Attach Copper (DAC) cables are commonly used, while Active Optical Cables (AOC) or optical modules with fiber jumpers are preferred for distances between 7 and 30 meters.

For distances beyond 30 meters, optical modules combined with fiber jumpers are recommended for flexibility and easier maintenance, as individual modules can be replaced without affecting the entire link.



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Co-

Packaged Optics (CPO) and Module StackingModern data centers are increasingly adopting Co-Packaged Optics (CPO), where optical transceivers are integrated directly with electronic components like ASICs or GPUs. In this approach, optical engines (PICs) can be stacked on top of electronic ICs (EICs) using advanced packaging techniques such as 2. 5D or 3D stacking.

This reduces the distance between optical and electrical components, improving bandwidth, lowering latency, and reducing power consumption. The stacking of optical modules in CPO is constrained by thermal management and interposer size, but careful placement of PICs and EICs allows multiple optical engines to be integrated efficiently while maintaining signal integrity.

Practical Considerations

Distance and medium: Choose DAC, AOC, or optical modules with fiber jumpers based on the required transmission distance. Maintenance: Using separate optical modules with fiber jumpers allows individual module replacement, unlike fixed-length AOCs. Thermal management: In CPO stacking, the placement of optical modules relative to electronic components affects heat dissipation and performance.

Bandwidth density: Stacking optical modules close to ASICs increases bandwidth density but requires careful design to avoid signal loss and thermal issues. In summary, optical modules can indeed be stacked, either in traditional switch stacking setups using fiber connections or in advanced CPO designs where optical and electronic components are integrated and stacked for high-performance data center applications. The choice of method depends on distance, cost, maintenance requirements, and performance goals.

Article Content

How to Choose Optical Modules for Switch Stacking?

To sum up, from the perspective of practicality and economy, DAC should be used for data transmission or switch stacking below 7 meters. AOC is

How to Select Optical Modules for Switch Stacking?-JIUZHOU

AOC active optical cable is used for switch data transmission or stacking between 7-30 meters, and optical modules + fiber jumpers are used for more than 30 meters.

Cisco Catalyst 1300 Series Stackable Switches Stacking Manual

To stack two or more devices, reconfigure the desired network ports as stack ports in the switches and connect the switches with the resulting stack ports in a ring or chain topology.

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Small-Form Factor Pluggable (SFP) and Stacking Accessories

This article provides technical data on Fiber Transceivers and stacking accessories compatible with Meraki devices.

Cisco Catalyst 9300 Series Switches Hardware Installation Guide

The optional StackWise-320 kit for Catalyst 9300L and 9300LM Series models consists of two stack adapters and a stacking cable. The default stacking cable is 0.5 m, however options of

Selecting Stacking Cables

Available Stacking Cables for Extreme Networks Switches lists the cable types that have been verified by Extreme Networks for use as stack connection hardware, along with the switches or modules with

Small-Form Factor Pluggable (SFP) and Stacking Accessories

Please reference the TMGmatrix for Cisco''s official optic-to-device compatibility list. Click this LINK for a filtered list of all optics for C9300/C9300L/C9300X platforms

Technology from 400G to 800G to 1.6T Transceivers | FiberMall

This paper describes the technical route of optical communication from 400G to 800G to 1.6T optical modules and compares pluggable and CPO.

Switch stacking: choose DAC, AOC or optical module + fiber jumper?

Generally speaking, in general applications, DAC high-speed cables are used to stack switches below 7 meters (usually switches in the rack), which can greatly reduce the cost. AOC

Which Cables Can Be Used for Stack Connections?

Stack setup just requires ordinary service cables instead of dedicated stack cables. Optical ports can be connected using high-speed cables, AOC cables, or optical modules+fibers.

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How to Choose Optical Modules for Switch Stacking?

Switch stacking refers to the combination of multiple switch devices that support the stacking feature, logically combined into one switching device. The main switch is responsible for the

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Switch stacking through optical modules can achieve high network reliability, large network data forwarding, and simplified network management.

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Nvidia''s $4B Photonics Venture: What You Need to Know The strategic investment in optical component suppliers Lumentum and Coherent heralds a new era of optical interconnects

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

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