

How to aggregate switches with different bandwidths

Article Overview

Aggregating switches with different port speeds is possible, but the total throughput is limited by the slowest link, and traffic distribution may be uneven.

Key Considerations

Link Aggregation Protocols: Use LACP (802.3ad) for dynamic link aggregation, which ensures both ends of the link agree on the configuration and provides automatic failover. Static LAGs are less flexible and prone to misconfiguration, especially when combining links of different speeds . **Bandwidth Mismatch:** When aggregating ports with different bandwidths, the slowest link becomes the bottleneck. Traffic is typically distributed per flow using a hashing algorithm based on source/destination MAC or IP addresses. This means a single flow cannot exceed the speed of one physical link, and higher-speed links may be underutilized . **Traffic Distribution:** Switches use scheduling algorithms to assign flows to physical links. With unequal link speeds, some flows may experience lower throughput, and packet reordering can occur if multiple links are used for the same session. To minimize issues, ensure that flows are kept on a single link whenever possible . **Practical Approaches:**

- o Aggregate only similar-speed ports when possible to maximize efficiency.
 - o Weighted load balancing can be used in some devices to assign more traffic to higher-speed links, though this is more common in WAN aggregation scenarios .
 - o MC-LAG (Multi-Chassis LAG) can provide redundancy and load balancing across multiple switches, but it does not eliminate the limitations of mismatched link speeds .
- Alternative Solutions:** If combining different-speed links is necessary, consider:
- o Using separate LAGs for high-speed and low-speed ports.
 - o Implementing SD-WAN or routing-based load balancing for WAN links with different bandwidths, which allows weighted traffic distribution and session stickiness to prevent packet reordering .

Summary

While you can aggregate switches with different bandwidths, the slowest link limits the maximum throughput per flow, and traffic may not be evenly distributed. Using LACP, careful planning of port speeds, and possibly weighted load balancing or SD-WAN techniques can help optimize performance and maintain redundancy .

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Ethernet Port Aggregation bonds multiple Ethernet ports into one logical link for more speed and redundancy

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