

Configuring Load Balancing for Core Switches



Overview

Understand EtherChannel Load Balance and Redundancy on Catalyst This document describes how to use the EtherChannel for load balance and redundancy on Cisc.

Key Takeaways

Load balancing across core switches can be achieved using Layer 2 link aggregation, Layer 3 ECMP routing, or dynamic load balancing protocols to distribute traffic evenly and ensure redundancy. Layer 2 Load Balancing

At Layer 2, link aggregation (LAG) or multi-chassis link aggregation (MC-LAG) can be used to combine multiple physical links into a single logical link between core switches and access switches. This allows traffic to be distributed across multiple links while providing redundancy in case one link fails. For example, Cisco Meraki switches use LACP to hash traffic based on source/destination IP, MAC, and port, ensuring even load distribution and rapid failure detection . Aruba's VSX solution also supports MC-LAG between two core switches, creating a resilient inter-switch link (ISL) for Layer 2 aggregation .

Layer 3 Load Balancing



For Layer 3 networks, dynamic routing protocols such as OSPF, EIGRP, or BGP can enable Equal-Cost Multi-Path (ECMP) routing. ECMP allows multiple paths to the same destination to be used simultaneously, distributing traffic across the available links. This approach provides both load balancing and redundancy, as traffic automatically reroutes if one core switch or path fails. Static routes can also be used with multiple equal-cost paths, but dynamic routing is generally preferred for scalability and automatic failover.

Dynamic Load Balancing (DLB)

Some platforms, like Juniper's Junos OS, support dynamic load balancing (DLB), which improves upon static hashing by considering link utilization and flow activity. DLB ensures that traffic is distributed more evenly across links, prevents congestion from “elephant flows,” and maintains packet ordering within a flowlet. This is particularly useful in data center environments where traffic patterns are unpredictable.

Best Practices

- **Stack or pair core switches:** If using separate switches, configure them as a stack or VSX pair to behave as a single logical unit for Spanning Tree and link aggregation purposes.
- **Configure downstream links first:** When setting up LACP or MC-LAG, configure the access switch side before the core switch side to avoid stranded ports.
- **Use consistent link characteristics:** Ensure aggregated links have the same speed and media type to prevent uneven load distribution.
- **Combine Layer 2 and Layer 3 strategies:** Use LAG/MC-LAG for access-to-core links and ECMP routing for core-to-core or core-to-distribution links to maximize redundancy and throughput. By combining these techniques, networks can achieve efficient traffic distribution, high availability, and rapid failover across core switches, supporting both enterprise and data center environments.

Article Content

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EtherChannel Load Balancing Explanation & Configuration

This article discusses EtherChannel load balancing, how it is configured and how to verify the EtherChannel load balancing

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Configuring a Load-Balancing Scheme

Prerequisites for a Load-Balancing Scheme Cisco Express Forwarding or distributed Cisco Express Forwarding must be enabled on

LAG Load Balancing on Cisco 350 and 550 Series

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Introduction: In this document you will learn about Ether-channel load balancing on Cat 6K, 7600, 4500, 3750.

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Objective This article explains how Link Aggregation (LAG) load balancing works on Cisco 350 and 550 series switches and how to

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This lesson explains how to configure Etherchannel (Link Aggregation) using PAgP and LACP on Cisco

Catalyst Switches for Microsoft Network Load Balancing Configuration ...

This document describes how to configure the Cisco Catalyst switches in order to interact with Microsoft Network Load

Configuring LAG Settings on a Switch through the Command Line ...

Step 2. From the Privileged EXEC mode of the switch, enter the Global Configuration mode by entering the following:

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For example, when you configure load balancing to use the source IP address, all non-IP traffic uses the source MAC address to

Catalyst 6500 Series Switch Content Switching Module (CSM ...

Note We recommend that you configure Layer 3 load balancing on server farms that contain firewalls because of the

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Figure 4-5 illustrates a basic dual firewall load balancing "sandwich" configuration hosted on one IOS SLB device,

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