Configuring Load Balancing on 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 BalancingAt 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 BalancingFor Layer 3 networks, dynamic routing protocols such as OSPF, EIGRP, or BGP can enable Equal-Cost Multi-Path (ECMP) routing.

ECM

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P 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.

DL

B 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

Link Aggregation and Load Balancing

Refer to MX Load Balancing and Uplink Preferences for details on how to implement. You may want to set up and configure a bonded link between your Meraki MS switch and a Cisco switch.

Understand how Load Balancing Works

Learn about load balancing on aggregated ethernet interfaces, and how to configure load balancing based on MAC addresses. It reduces network congestion by dividing traffic among multiple

Configuring Cisco Port Channels: Step-by-Step Tutorial

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Setting up port channels on Cisco switches is an essential skill for network engineers to optimize the performance and reliability of a network. This step-by-step tutorial will guide you through

Optimizing Cisco Switches for High Availability and Load Balancing

Learn how to optimize Cisco switches for high availability and load balancing to ensure seamless network performance and resilience in enterprise environments.

How to Configure EtherChannel Load Balancing Methods

Configuring EtherChannel load balancing methods on Cisco switches helps distribute traffic evenly across bundled links. There are several load balancing methods available.

Mastering EtherChannel Load Balancing Methods: A Complete Guide

Understanding how to differentiate and implement EtherChannel Load Balancing Methods is critical for anyone pursuing CCNP Enterprise (ENCOR) certification or working in enterprise network roles.

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Understand EtherChannel Load Balance and Redundancy on Catalyst Switches

This document presents the concept of load balancing and redundancy on Cisco Catalyst switches with the use of the EtherChannel. This document also covers the Port Aggregation

Configuring a Load-Balancing Scheme

Prerequisites for a Load-Balancing Scheme Cisco Express Forwarding or distributed Cisco Express Forwarding must be enabled on your switch or router. If you enable per-packet load balancing for

Configuring a Load-Balancing Scheme [Cisco IOS 15.0SY]

This module contains information about Cisco Express Forwarding and describes the tasks for configuring a load-balancing scheme for Cisco Express Forwarding traffic. Load-balancing

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