Building aggregation layer switch

Article Overview

An aggregation layer switch consolidates traffic from multiple access switches and connects to the core layer, providing scalability, redundancy, and high-performance network traffic management.

Purpose of the Aggregation Layer

The aggregation layer, also called the distribution layer, serves as a central point to interconnect multiple access switches and the core layer, simplifying network design and improving scalability. Without this layer, connecting all access switches in a full mesh would require excessive cabling and complex management, especially in large campuses or multi-building environments . It also provides a location for connecting servers, storage, and other network services, though end-user devices should not connect directly to this layer .

Design Considerations

o Redundancy: Aggregation switches are typically deployed in pairs using Multi-Chassis Link Aggregation (MCLAG) or similar technologies to ensure resiliency. Each switch should have dual hot-swappable power supplies and redundant fans .
o Layer 2 and Layer 3 Support: Aggregation switches can operate at Layer 2 or Layer 3, depending on network topology. They often support link aggregation protocols like LACP to combine multiple physical links into a single logical connection, enhancing bandwidth and failover capability .
o Fault Isolation: Using technologies like Extreme Networks' EAPS or Cisco's Virtual Device Context (VDC) allows for control-plane isolation and fault domain separation, minimizing the impact of failures and improving network reliability .
o Scalability: Aggregation switches can handle thousands of devices passing through, and multiple blocks of paired switches can be deployed to accommodate large campuses with many floors or buildings .

Connectivity and Configuration

o Access Layer Connection: Each aggregation switch connects to all access switches, forming a partial-mesh topology to maintain redundancy without creating broadcast loops .
o Core Layer Connection: Aggregation switches connect upstream to the core layer, which provides high-speed routing, security services, and inter-building connectivity .
o Data Center Integration: In data center environments, aggregation switches often connect to high-speed core switches and may host dual-attached servers or storage devices. Cisco Nexus designs, for example, use vPC and VDCs to provide logical partitioning and control-plane isolation .

Best Practices

o Avoid connecting end-user devices directly to aggregation switches to maintain security and simplify management .
o Use redundant power and cooling to prevent single points of failure.
o Implement link aggregation and partial-mesh topologies to maximize bandwidth and resiliency.
o Apply VLAN segmentation and control-plane isolation to protect against misconfigurations or attacks affecting multiple network segments . By following these principles, an aggregation layer switch can effectively consolidate traffic, provide high availability, and support scalable, efficient network operations in both campus and data center environments.

Learn about the aggregation layer in networking, its purpose, and how it connects to the distribution layer. Discover

An aggregation switch operates at Layer 2 or Layer 3 of the OSI model, depending on the

The following figure shows an aggregation-layer building block. Multiple blocks of pairs of aggregation switches extend the design of

Routing and switching layers are integral components of an enterprise network that managers can identify and separate to optimize

What is the difference between an aggregate switch and a core switch? An aggregate switch consolidates traffic from

Aggregation Switch refers to a device used to aggregate multiple low-speed links in a network and connect them to a

In this article, I"m going to describe how to set up Link Aggregation between two managed switches to provide connectivity,

The aggregation layer switch is the aggregation point of multiple access layer switches. It is used to export the access

Link aggregation is a way of bundling a bunch of individual (Ethernet) links together so they

OSI layer 2 (data link layer, e.g. Ethernet frame in LANs or multi-link PPP in WANs, Ethernet MAC address) aggregation typically

Core Layer: The high-speed backbone, often connecting multiple distribution switches. Distribution Layer: The middle

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Introduction This chapter covers the design recommendations for a data center design deployment consisting of a Cisco Nexus®

03-Layer 2--LAN Switching Configuration Guide 00-Preface 01-MAC address table configuration 02-Ethernet link aggregation

Designing and Configuring the Aggregation Layer The network switches in the aggregation layer provide additional resiliency

The aggregation switch is located in the middle of the network architecture, which is equivalent to a middle-level

In the context of network architecture, switch aggregation is an essential element,

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