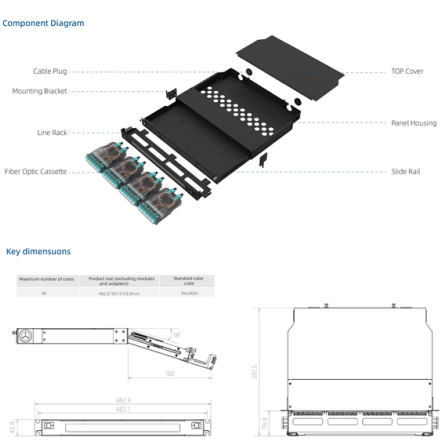
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PoE Switch Hierarchy



Overview

Set the power priority for individual interfaces when there is insufficient power for all PoE interfaces.

Key Takeaways

PoE switches are typically deployed at the access layer of a network, providing both power and data to edge devices, while aggregation and core layers handle routing, policy enforcement, and high-speed backbone connectivity.Network Layer Placement

Access Layer: PoE switches are primarily positioned at the access layer, connecting end devices such as IP cameras, VoIP phones, wireless access points, and IoT devices. They deliver both data and electrical power over a single Ethernet cable, simplifying installation and reducing the need for separate power sources . Access layer switches often support IEEE standards like 802.3af (PoE), 802.3at (PoE+), and 802.3bt (PoE++), providing up to 100W per port depending on device requirements . Aggregation Layer: Above the access layer, the aggregation layer consolidates traffic from multiple access switches, performs inter-VLAN routing, enforces policies, and manages bandwidth. While aggregation switches may not always provide PoE, they are critical for link consolidation and network scalability . Core Layer: The core layer forms the high-speed backbone of the network, connecting aggregation switches and providing non-blocking, high-capacity switching. Core switches typically do not supply PoE but ensure fast, reliable data transport across the network .

PoE Switch Types and Functions
• Endpoint PSE (Power Sourcing Equipment): Ethernet switches with built-in PoE functionality that directly power connected devices .

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• Midspan PSE: Devices inserted between a non-PoE switch and powered devices to inject power into the Ethernet link .

• PoE Passthrough Switch: Receives power from an upstream PoE source and passes it to downstream devices, acting as both a powered device (PD) and PSE simultaneously .
Power Planning Considerations

When designing a PoE network, it is important to calculate the power budget per switch: Maximum Per Port Power Average = (Maximum Power Consumption – System Power) / Number of PoE Ports . This ensures that all connected devices receive sufficient power without overloading the switch. Real-world deployments must also account for copper transmission loss, especially when powering multiple high-wattage devices like access points or cameras .

Summary

In a typical enterprise network hierarchy:

• Access Layer: PoE switches power and connect edge devices.

• Aggregation Layer: Consolidates traffic, enforces policies, and routes between VLANs.

• Core Layer: Provides high-speed backbone connectivity without PoE. This hierarchical approach ensures efficient power distribution, simplified cabling, and scalable network design while maintaining reliable connectivity for all devices .

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