

Article Overview

A Layer 2 Ethernet switch forwards data frames based on MAC addresses, operating at the data-link layer of the OSI model to efficiently connect devices within a LAN.

Overview

A Layer 2 switch is a network device that operates at the data-link layer (Layer 2) of the OSI model, primarily using MAC addresses to forward Ethernet frames to the correct destination port without broadcasting to all ports. Unlike a hub, which sends data to all connected devices, a Layer 2 switch selectively forwards frames, reducing network congestion and improving performance.

How It Works

- o **MAC Address Learning:** When a frame arrives, the switch reads the source MAC address and records the port it came from in its internal MAC address table.
- o **Forwarding Decision:** The switch checks the destination MAC address in the table:
 - o If the address is known, the frame is sent only to the corresponding port.
 - o If unknown, the frame is broadcast to all other ports, and the switch learns the new MAC address when the destination responds.
- o **Low Latency:** Layer 2 switches operate near wire speed, providing extremely low latency for LAN traffic.

Key Features

- o **Multiport Bridging:** Functions as a multiport bridge connecting multiple LAN segments.
- o **VLAN Support:** Can create Virtual LANs to logically segment networks without changing physical topology.
- o **Plug-and-Play:** Many Layer 2 switches are simple to deploy, requiring minimal configuration.
- o **Management Options:** Managed Layer 2 switches offer features like port security, traffic monitoring, and QoS prioritization.

Applications

- o **Small to Medium Networks:** Ideal for connecting computers, printers, and IP phones within a LAN.
- o **Data Centers:** Used as Top-of-Rack (ToR) switches to connect servers efficiently.
- o **Industrial Networks:** Industrial-grade Layer 2 switches provide redundancy, security, and compliance with standards like IEC 62443.

Examples

Ethernet Layer 2 Switch

Popular Layer 2 switches include:

- o NETGEAR GS308EPP: 8-port Gigabit switch with PoE+ support, energy-efficient, and smart managed .
- o Moxa Layer 2 Managed Switches: Industrial-grade switches with network redundancy and security features .

Summary

A Layer 2 Ethernet switch is essential for efficient LAN communication, forwarding frames based on MAC addresses, supporting VLANs, and reducing unnecessary traffic. It is widely used in office networks, data centers, and industrial environments, offering both unmanaged plug-and-play options and advanced managed features for network control and monitoring.

To support planners while creating specification and project documents, here we provide specification texts for products

F: Welches Ethernet-Switch-Modell sollte ich für mein Netzwerk verwenden, Layer 2 oder

The data link layer, or layer 2, is the second layer of the seven-layer OSI model of computer networking. This layer is the protocol

Moxa's Layer 2 managed switches feature industrial-grade reliability, network redundancy, and security features based on the IEC

Learn about the Layer 2 and Layer 3 switching, OSI model, & choosing the right switches to optimize network

Layer 2 Managed Switches As the use of industrial Ethernet devices increases, network security, segment isolation, and packet

Westermo bietet eine breite Palette von industriell abgestuften gemanagten Layer-2-Switches und Geräteservern für zuverlässige und

Ethernet switches come in various types, including Unmanaged Switches, Managed Switches

Layer 2 switches operate at the data link layer, forwarding data based on MAC addresses, while layer 3 switches route

In this guide, we've tested and reviewed the best layer 2 switch to help you choose the perfect switch for your

specific

The Layer 2 journey involves sophisticated mechanisms that have evolved tremendously since the early days of

In Layer 2 vs Layer 3 Switch lesson, we will compare layer 2 switches (simple switches) with layer 3 switches (multilayer switches).

Learn the key differences between Layer 2 and Layer 3 switches, their applications, and how to choose the right one

Multilayer switch Multi-layer switching combines layer-2, -3 and -4 switching technologies and provides high-speed scalability with

General Overview of Layer 2 Layer 2 is Data Link Layer (DLL) as per OSI Model. As we know function of each layer is

Conclusion Layer 2 switches are essential building blocks in modern networking, providing efficient data forwarding

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