

How to use a Layer 2 access switch



Overview

This article describes Layer 2 Switch, a form of Ethernet switch. How it operates and when to use it. Learn all about it.

Key Takeaways

A Layer 2 access switch is a switch that operates at the OSI Layer 2 (Data Link layer) and forwards traffic using MAC addresses, typically used to connect end devices within the access layer of a LAN. It provides VLAN segmentation, MAC learning, and frame switching within the same broadcast domain, without performing Layer 3 routing.

- Operates at Layer 2 (Data Link layer) using MAC address tables to forward frames.
- Connects end devices such as PCs, printers, phones, and access points.
- Segments networks using VLANs, enabling broadcast domain separation.
- Provides full-duplex switching to eliminate collisions and improve throughput.



- Does not perform routing between VLANs (requires a Layer 3 device for inter-VLAN routing).

Key Features

Feature Description	MAC Address Learning
Learns source MAC addresses dynamically and builds a forwarding table.	
VLAN Support	Allows segmentation of the access network into multiple broadcast domains.
Access & Trunk Ports	Ports can be configured as access (single VLAN) or trunk (multiple VLANs).
Collision Domain Isolation	Each port is its own collision domain, improving performance.
Broadcast Forwarding	For unknown MAC addresses, floods frames to all ports except the source.

Typical Use Cases

- Enterprise access layer connecting user devices.
 - Data center access layer where VLAN extension and Layer 2 adjacency are required (e.g., clustering, NIC teaming).
 - Small and medium LANs that do not require routing at the edge.
- Basic Configuration Example (Cisco IOS)**

To configure a port as a Layer 2 access port:

```
interface GigabitEthernet1/0/1 switchport mode access switchport access vlan 10
spanning-tree portfast
```

To configure a trunk port:

```
interface GigabitEthernet1/0/24 switchport mode trunk switchport trunk allowed vlan 10,20,30
switchport trunk native vlan 10
```

(Commands based on Cisco Layer 2 switching configuration guidelines.)

Summary

A Layer 2 access switch provides MAC-based forwarding, VLAN segmentation, and collision-free switching for end devices in the access layer, forming the foundation of most enterprise LAN architectures.

Article Content

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