

Access Network Layer 2 Switch



Overview

L2 vs L3 Switch: How to Choose for Your Access Layer Learn how to choose between L2 and L3 switches and build an access network that's reliable, scalable.

Key Takeaways

An Access Network Layer 2 switch connects end devices within a LAN, forwarding traffic based on MAC addresses and providing VLAN segmentation, security, and PoE support. **Role in the Network**

A Layer 2 switch operates at the Data Link layer (Layer 2) of the OSI model, primarily forwarding Ethernet frames between devices within the same LAN using MAC addresses to identify destinations. In a hierarchical network, it functions at the access layer, serving as the entry point for end devices such as computers, IP phones, printers, and wireless access points. It connects these devices to the distribution layer, which then links to the core network.

Key Functions

- **MAC Address Table:** Maintains a table mapping each connected device's MAC address to its port, enabling precise frame forwarding and reducing unnecessary traffic.
- **VLAN Support:** Segments the network into Virtual LANs, improving security and traffic management.
- **Traffic Management:** Each port acts as its own collision domain, minimizing collisions and improving data flow.

- **Security Features:** Implements port security, DHCP snooping, and static MAC address configuration to prevent unauthorized access .
 - **Power over Ethernet (PoE):** Supplies power to devices like IP phones and cameras directly through the network cable .
- Comparison with Layer 3 Switches

Unlike Layer 3 switches, which can perform IP routing and inter-VLAN routing, Layer 2 switches do not route traffic between different networks; they only forward frames within the same LAN segment . Layer 3 switches are typically used in larger networks where routing between VLANs or subnets is required, while Layer 2 switches are cost-effective and simpler for small to medium-sized networks .

Communication Process

When a device sends a frame, the Layer 2 switch reads the source MAC address and updates its MAC table. If the destination MAC is known, the switch forwards the frame to the correct port; if unknown, it broadcasts the frame to all ports within the VLAN . Protocols like ARP are used to map IP addresses to MAC addresses, enabling devices to communicate effectively within the LAN .

Practical Use Cases

- **Enterprise Access Layer:** Connecting end-user devices to the network with VLAN segmentation and security enforcement .
- **Campus Networks:** Providing high port density and PoE for IP phones, cameras, and wireless access points .
- **Small and Medium Businesses:** Offering simple, low-latency connectivity without the complexity of Layer 3 routing . In summary, an Access Network Layer 2 switch is a foundational device in LANs, ensuring efficient, secure, and organized connectivity for end devices while supporting VLANs, PoE, and traffic management within the access layer.

Article Content

L2 vs L3 Switch: How to Choose for Your Access Layer

Learn how to choose between L2 and L3 switches and build an access network that's reliable, scalable, and easy to

Access, Distribution, and Core Layers Explained

Switches in this layer are called access switches. End devices connect to the LAN through

Layer 2 Switch

Layer 2 switches are generally used in combination with routers to create larger networks. Layer 2 switches are used

L1 vs L2 vs L3 Switches: Key Differences Explained Simply

Confused between L1, L2, and L3 switches? Learn the key differences, features, and use cases to pick the right one

Configuring Layer 2 Switching

You can configure Layer 2 switching ports as access or trunk ports. Trunks carry the traffic of multiple VLANs over a single link and

Difference between layer-2 and layer-3 switches

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

Layer 2 vs Layer 3 Switch: Key Differences and Use Cases

A Layer 2 switch forwards traffic within the same VLAN using MAC addresses, while a Layer

Cisco Switch Layer2 Layer3 Design and Configuration

Network Diagram The diagram above shows one Layer 3 switch used for Aggregation, three Layer 2 switches used for access

Layer 2 vs. Layer 3 Switching: Network Layers

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

Layer 2 vs Layer 3 Switch: What's the Difference? | Auvik

Layer 2 of the OSI model is known as the data link layer. The Layer 2 protocol you're likely most familiar with is

Example for Configuring a Layer 2 Switch to Work with a Router for ...

In Figure 1-3, a company has multiple departments that belong to different network segments, and each department needs to access

Layer 2, Layer 3, and Layer 4 Switches

Layer 2, Layer 3, and Layer 4 Switches What Is a Layer? A network switch connects devices and switches data between ports.

Understanding the Differences Between Layer 2 and Layer 3 Switches

Layer 2 and Layer 3. Layer 2 switches operate at the data link layer (layer 2) of the OSI model and forward data packets based on

Understanding Access Switches: Key Components of Your Network Switch ...

Explore the role of access switches in your LAN setup. Understand their key components, functions in the access layer,

Understanding the Role of an Access Switch in Your

An access layer switch refers to a network device that is designed in such a way that it

Core Switch vs. Distribution Switch vs. Access Switch

The access switch is the network switch that connects the access layer with the subnets. The subnets are integrated with access

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How to Choose Between Layer 2 Switches VS Layer 3 Switches

Among these, layer 2 switches are one of the key requirements for any high speed network. As the converged networks grow in size,

Layer 2 Networking | Junos OS | Juniper Networks

Layer 2 is equivalent to the link layer (the lowest layer) in the TCP/IP network model. Layer2 is the network layer used to transfer

Layer 2 Protocols | Types of Network L2 Protocols

Layer 2 protocols or network L2 protocols are a list of communication protocols used by Layer 2 devices (such as network interface

Access vs. Distribution vs. Core Switch Comparison Guide

The most common model is the three-tier hierarchy: Access Layer, Distribution Layer, and Core Layer. Each layer is served by

Layer 2 vs. Layer 3 Switching — A Comprehensive Comparative ...

Layer 2 Switching: Operation and Core Concepts Key Characteristics of Layer

Data Center Access Layer Design

The loop-free U topology design provides a Layer 2 access solution with active uplinks and redundancy via an inter

What are the Differences between Layer 2, Layer 3, and Layer 4 Switches ...

Layer 2 switches are widely used and are generally applied in the access layer of a local area network (LAN) to

What Is a Layer 2 Network?

Learn what a layer 2 network is, how it works, and its main components and protocols in this data link layer networking

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Layer 2 vs. layer 3 switch: Understanding the differences that impact IT

Layer 2 vs. layer 3 switch: Understanding the differences that impact IT Switch ports are essential components of network

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Layer 2 and Layer 3 switches

Rather it's to Layer 2 (the Data Link layer) that most switches look when deciding how to move packets around a

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In this layer, the layer 2 switches are installed to distribute the data packets to the addressed group of access devices. The layer 2

Overview of Layer 2 Switched Networks and Communication

All devices in a network are connected to a switch which interconnects them; this is Layer 1 (inter-connection). Now

Layer 2 vs Layer 3 Switches in 2026: How to Design a Modern Network

Learn Layer 2 and Layer 3 switches in 2026. Covers features, performance, design patterns (campus, branch, data

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