How many layers should the core switch use



Overview

The core layer, distribution layer (layer 2), and access layer (layer 3) are the three layers used to build hierarchy networks for industrial, domestic, and commercial data transmission.

Key Takeaways

A core switch typically operates at the top layer of a three-tier network architecture, connecting distribution layers and ensuring high-speed backbone traffic, with the number of physical switches depending on network size and traffic volume.

Core Switch in Network Hierarchy

In a standard enterprise network, the core switch resides at the core layer, which is the top of the three-tier hierarchy: access, distribution, and core layers. Its primary role is to aggregate traffic from distribution switches and provide ultra-low latency, high-throughput connectivity across the network. Core switches generally operate at Layer 3, handling routing between VLANs and subnets, while delegating policy enforcement and security tasks to lower layers to maintain maximum performance.

Layer ConsiderationsThree-Tier Architecture: The most common design uses access, distribution, and core layers. The core switch sits at the top, connecting multiple distribution switches and ensuring fast inter-segment data transfer. Collapsed Core Architecture: In smaller networks, a high-performance distribution switch can perform both distribution and core functions, effectively reducing the number of physical layers while maintaining performance.

© 2026 KENHARDT OPTICAL NETWORKS - All rights reserved

This is cost-effective for networks with fewer than 150 devices. Multiple Core Switches: Large networks often deploy redundant core switches to prevent bottlenecks and ensure high availability. Using multiple core switches allows load balancing and fault tolerance, which is critical for enterprise-scale environments.

Practical Guidelines

Small Networks (150 devices): Deploy dedicated core switches at the top layer, often in pairs or clusters for redundancy, to prevent backbone congestion and maintain high-speed connectivity.

Summary

The core switch itself operates at a single logical layer—the core layer—but the number of physical switches and whether a collapsed or full three-tier design is used depends on network size, traffic volume, and redundancy requirements. For large enterprise networks, multiple core switches are recommended to ensure scalability, fault tolerance, and optimal performance.

Article Content

Which Layer Is the Core Switch Really In? 2026 L2 vs

Which layer is the core switch? The core switch is the physical core layer. It can be considered a central network layer that performs all the functions,

Core Switch vs. Distribution Switch vs. Access Switch

The core layer, distribution layer (layer 2), and access layer (layer 3) are the three layers used to build hierarchy networks for industrial, domestic, and commercial data transmission.

What Is a Core Switch? Network Backbone Architecture Guide

To achieve backbone speeds, a core switch must operate at Layer 3 of the OSI model, bridging the gap between traditional MAC-based switching and IP-based routing.

How to Choose a Core Layer Switch?

Generally speaking, core switches are Layer 3 switches, which can support various network protocols such as routing protocol/ACL/load balancing and have rich functions.

Understanding Core Switch: What It Is and How to Choose the

Typically, core switches are Layer 3 switches equipped with robust network management capabilities. They are characterized by numerous ports and high bandwidth, offering greater reliability,...

© 2026 KENHARDT OPTICAL NETWORKS - All rights reserved

Understanding Core Switch: What It Is and How to Choose the Right

Core switches are critical for establishing a fast and reliable network architecture through high-speed data forwarding. Typically, core switches are Layer 3 switches equipped with robust

Core layer | FortiSwitch 7.4.0 | Fortinet Document Library

Each aggregation switch requires 5x100-GbE links to the other switches. With the use of a core layer, each aggregation switch only needs 2x100-GbE links, and the core layer is the only place where you

Core Differences Between Layer 2 and Layer 3 Switches

· Layer Positioning: The network layer (Layer 3) of the OSI model, integrating switching and routing capabilities, and supporting dual parsing of MAC addresses and IP addresses.

Access, Distribution, and Core Layers Explained

This tutorial provides an overview of the access, distribution, and core layers and explains two-tier and three-tier campus LAN designs.

Understanding the Core Switch: Key Differences and Uses

A: Core switches add value to the aggregation layer of the network by effectively merging the output of several distribution layers, managing data flow, and providing swift connectivity between

Core Switch vs. Distribution Switch vs. Access Switch

Core Switch vs. Distribution Switch vs. Access Switch: Understand Their Roles in Ethernet Networks Ethernet networks are growing and becoming more complex, with high-capacity WANs now being

How to Choose a Core Layer Switch?

As the core backbone layer of the entire network architecture, the core layer bears the traffic transmission of the entire network, so the core layer has high requirements for core switches

Understanding the Different Layers of Routing and Switching

Choosing a separate core comes with both capital and operational expenses and should be avoided unless absolutely necessary. As with user access core layers, data center cores generally also

Build Your Skills: The three-layer hierarchical model

© 2026 KENHARDT OPTICAL NETWORKS - All rights reserved

Explains the three layers critical to network design: Access, Distribution, and Core Anyone involved in networking and/or telecommunications should be somewhat familiar with the use

Three-Layer Model

The Cisco hierarchical model can help you design, implement, and maintain a scalable, reliable, cost-effective hierarchical internetwork. Cisco defines three layers of hierarchy, as it is shown below, each

Understanding Core Switch: What It Is and How to Choose the

A core switch is not merely a type of switch but rather denotes the switch that operates at the core layer (the network''s backbone). Positioned at the top of the three-layer network architecture ...

How to Choose the Right Core Switch for Enterprise Network?

Core switches lie at the heart of the enterprise networks and take the duty for high-speed routing and switching. Traffic growth at the access layer and distribution layer will impact the

Access vs. Distribution vs. Core Switch Comparison Guide

Distribution Layer Switches: Positioned between the access and core layers, distribution switches aggregate traffic from multiple access switches. They are typically Layer 3 devices responsible for

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

© 2026 KENHARDT OPTICAL NETWORKS - All rights reserved

Contact Us

Continue your research online:

Website: https://kenhardtprimary.co.za
Technical inquiry: https://kenhardtprimary.co.za/project-desk.html
African project coordination: Century City, Cape Town, Western Cape, South Africa

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

© 2026 KENHARDT OPTICAL NETWORKS - All rights reserved