

## Article Overview

A gigabit core switch is a high-performance Layer 3 switch operating at 1 Gbps per port, serving as the backbone of a network to efficiently route and manage traffic.

## Role of a Core Switch

A core switch sits at the top of a network hierarchy, connecting distribution or aggregation switches and acting as the central backbone of the LAN. It ensures high-speed data forwarding, low latency, and reliable connectivity across the network, supporting hundreds of devices and critical applications . Core switches typically offer Layer 3 routing capabilities, redundancy, and advanced management features to maintain network stability .

## Gigabit Switch Characteristics

A gigabit switch provides 1 Gbps speeds per port, significantly faster than older Fast Ethernet (100 Mbps) switches . Gigabit switches can be fixed-port, stackable, or chassis-based, with port counts ranging from 8 to 48 or more, and support both copper (RJ45) and fiber (SFP) connections . They use packet switching and MAC address learning to efficiently forward traffic only to the intended destination, reducing collisions and latency .

## Implications of a Gigabit Core Switch

- o Throughput and Bandwidth: A gigabit core switch can handle substantial traffic from multiple distribution switches, but for very large networks or high-bandwidth applications, higher-speed core switches (10G, 40G, or 100G) may be preferred .
- o Network Performance: Gigabit speeds reduce bottlenecks compared to Fast Ethernet, supporting streaming, VoIP, video surveillance, and other bandwidth-intensive applications .
- o Scalability: Many gigabit core switches support link aggregation, allowing multiple ports to combine bandwidth for higher throughput and redundancy .
- o Port and Backplane Considerations: The switch's backplane bandwidth and forwarding rate must match the number of connected devices to avoid congestion. For full-duplex non-blocking performance, the backplane bandwidth should meet or exceed the total port capacity .

## Summary

A gigabit core switch is suitable for small to medium enterprise networks, providing 1 Gbps connectivity, reliable routing, and low latency. While it is sufficient for many LAN environments, larger networks with heavy traffic may require higher-speed core switches to maintain optimal performance and future scalability .

# Core Switch

Discover what a Core Switch is, its pivotal role in network architecture, and how it boosts performance and reliability in

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Explore the core switch's role as the backbone of your network. Discover key differences,

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A core switch is the backbone of a large-scale network, designed to handle massive volumes of traffic with ultra-low latency and

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