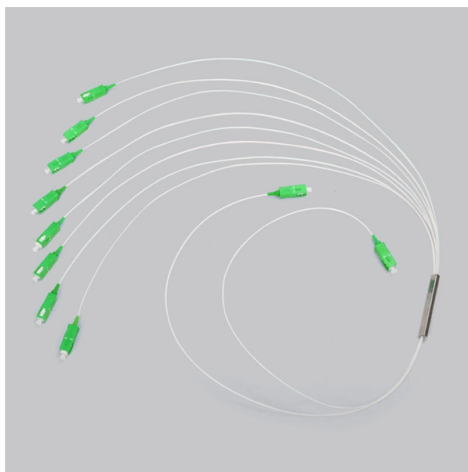


Number of devices connected to a Layer 3 core switch



Overview

Routers and L3 Switches | NetworkAcademy.IO In this lesson, we examine the network devices that operate at Layer 3 of the OSI model. We start with the intro.

Key Takeaways

The number of devices connected to a Layer 3 core switch depends on its port capacity, network design, and the use of aggregation and access layers rather than a fixed limit. Core Switch Role and Connectivity

A Layer 3 core switch operates at the backbone of a hierarchical network, performing both high-speed switching and routing between subnets and VLANs . Core switches typically do not connect end devices directly; instead, they connect distribution switches, which in turn connect access switches that serve end devices like PCs, IP phones, and wireless access points . This design ensures scalability and reduces cabling complexity while maintaining high performance.

Determining the Number of Connected Devices

The total number of devices that can communicate through a core switch depends on several factors:

- **Port Density:** Core switches have a limited number of physical ports, often ranging from 24 to 128 or more. Each port can connect to a distribution switch or another core switch .

- **Aggregation:** Multiple access switches can be aggregated through distribution switches using EtherChannel or Eth-Trunk links, allowing hundreds or thousands of end devices to be indirectly connected to the core .
- **VLANs and Subnets:** Layer 3 switches route traffic between VLANs and subnets. The number of devices per VLAN is limited by IP addressing and broadcast domain considerations, not the switch itself .
- **Network Design:** In large networks, multiple core switches are often deployed in a redundant, stacked, or clustered configuration, further increasing the number of devices supported without overloading a single switch .

Practical Example

In a typical enterprise network:

- Each access switch may have 24–48 ports for end devices.
- Several access switches connect to a distribution switch, which aggregates traffic.
- The core switch connects multiple distribution switches, handling thousands of devices indirectly. Thus, while a core switch may have only 48 physical ports, it can support thousands of end devices through hierarchical design and aggregation .

Key Takeaways

- There is no fixed number of devices for a Layer 3 core switch; it depends on port count, network topology, and aggregation strategy.
- Core switches are designed to route and switch traffic efficiently between subnets and VLANs rather than directly connecting all end devices.
- Proper hierarchical network design ensures scalability, reliability, and high performance for large networks.

Article Content

Network switch

An Ethernet switch operates at the data link layer (layer 2) of the OSI model to create a separate collision domain for each switch

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These switches usually offer many ports and sometimes Power over Ethernet (PoE) to power connected devices. Distribution layer

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