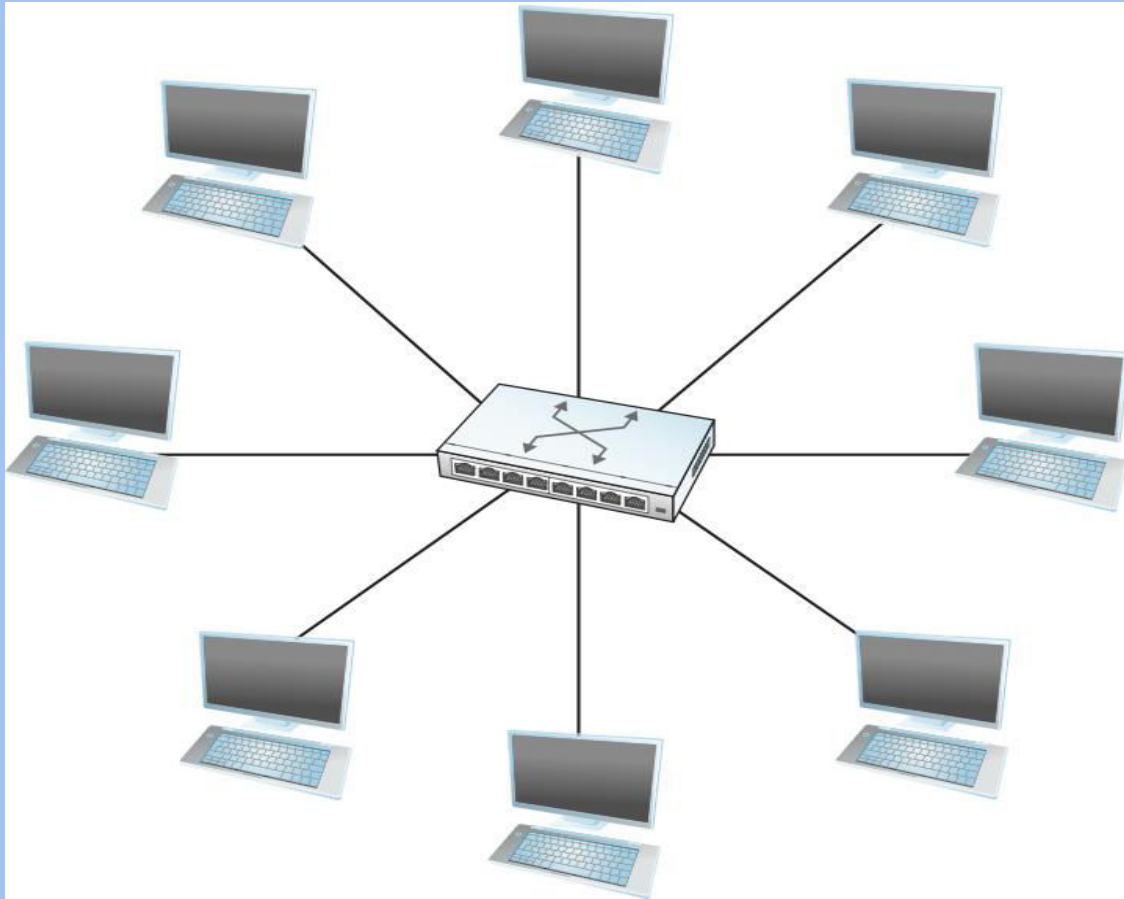# Switch
(Network Device)

Elementrix Classes

What is a Switch?

❏ A switch is an intelligent networking device operating at the Data Link Layer (Layer 2) of the OSI model. It acts like a traffic director for your network, ensuring data packets reach their intended destinations efficiently and securely. Unlike a hub, which simply broadcasts data to all connected devices, a switch utilizes its intelligence and learning capabilities to optimize network traffic flow.

How does a Switch Work?

❏ **Learning:** Switches are like name-learning experts. They "learn" the MAC addresses of devices connected to each of their ports. These unique addresses are like identification tags for network devices. The switch builds a switching table that maps MAC addresses to their corresponding ports.

❏ **Receiving and Analyzing:** When a data packet arrives at a switch port, the switch examines the destination MAC address embedded within the packet header. This address specifies the intended recipient of the data.

❏ **Forwarding with Intelligence:** Using the information in its switching table, the switch forwards the data packet only to the port where the intended recipient device is connected. This targeted approach significantly reduces unnecessary network traffic, unlike a hub that broadcasts data to all devices.

Benefits of Switches:

❏ **Improved Performance:** By directing data only to the intended recipient, switches reduce network congestion and optimize data flow, leading to a faster and more responsive network experience.

❏ **Reduced Collisions:** Unlike hubs, switches operate in full-duplex mode, meaning they can send and receive data simultaneously on each port. This eliminates the possibility of collisions that can occur in hubs, ensuring reliable data transmission.

❏ **Enhanced Security:** By not broadcasting data to all devices, switches offer a layer of security compared to hubs. Data reaches only the intended recipient, minimizing the risk of unauthorized access.

❏ **Scalability:** Networks can be easily expanded by adding more switches, making them suitable for growing environments.

पढ़िए और पढ़ाइये

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