2

1. MAC address learning process of a switch

The job of a switch is to know which device is connected to which port, so it can send data to the right place. It does this using MAC addresses.

When a switch is first turned on, its MAC address table is empty. As soon as a device sends data through the switch, the switch learns the Source MAC address in that data. For example, if a laptop sends that data, the switch notes the laptop's MAC a frame into port 1, the switch notes the laptop's MAC address is reachable through port 1. This information is saved in the MAC address table. Next, the switch checks the destination MAC address. If the switch already know which port that destination device is connected to, it sends the frame only through that specific port. If the switch does not know the destination MAC address, it sends the frame out of all ports except the one it came from. Once the destination device replies, the switch learns its MAC address too.

2.

Network Design Models

A. Three Layer Campus Network design
— Consists of the Access Layer, the distribution
layer, and the Core layer.

The Access layer is where Users and devices
connect. E.g, When you plug your laptop into a wall
Socket at the office, you are connecting to the
Access layer.

The Distribution layer sits between the access
layer and the core layer — and controls how different
parts of the network Communicate. E.g: Routing
between departments happens here.

The core layer moves data quickly and reliably
across the entire Campus.

B. Spine-leaf design

The design is built to handle large amounts of traffic with predictable performance.
It uses only two layers: Spine Layer & Leaf Layer. Leaf switches connects directly to the servers or end devices. Spine switches sits above Switch the Leaf switches. Spine switches are connected to different them. If two servers are connected to them. If two servers are connected to different leaf switches, the data usually passes through the Spine switch. It is consistent, delay is low and performance is stable. The design works best in platforms where different servers are deployed to talk to each other at the same time.

3.

B.C. Collapse Core Network design

This is the simpler version of the three-layer Campus design. Here, the Core layer and distribution layers are combined into one.

Just like the first design, devices still connect through the Access Layer, however, instead of passing traffic through the distribution and core layer separately, everything is handled by the collapsed core. The design is easy to manage and serves cost. Small offices may deploy this design.