

TCP VS UDP

TCP/UDP are the underlying protocol which helps other protocols to work.

TCP (Transmission Control Protocol)

- ↳ Reliable
- ↳ Connection-oriented
- ↳ Virtual circuit
- ↳ Sequenced
- ↳ Acknowledgements
- ↳ 24-60 bytes (high overhead)

UDP (User Datagram Protocol)

- ↳ Unreliable
- ↳ Connectionless
- ↳ No virtual circuit
- ↳ Un-sequenced
- ↳ No acknowledgement
- ↳ 8 bytes (lightweight)

Firewall

Firewalls are security devices used to prevent unauthorized access to a LAN from the internet.

↳ can be a hardware appliance or host-based software.

↳ The Demilitarized Zone (DMZ) is a segment of the network that a firewall does not protect, this is used to intentionally expose a device to the internet.

Access Point (AP)

APs are used to provide and manage wireless communications in a LAN.

↳ Uses Radio Frequencies (RF) to transmit host data.

SOHO Router

are multifunction devices offering many features beyond routing.

↳ Always includes wireless, switching, firewall security, and DHCP.

↳ Can include content filtering, file server, print server, VPN client and server and other features.

↳ Used to connect a LAN to the internet.

↳ Forward traffic based on IP addresses in packets.

Networking Devices :-

Network Interface Card (NICs)

↳ one used to connect devices to a network.

• It's common for NICs to be built-in into modern computer system.

• Each NIC has a unique 48 bits MAC addresses

• The link light and activity lights are used to trouble connections made to the NIC.

↳ Link Light - verifies the cable is plugged in at both ends

↳ Activity Light will blink as data goes through the interface.

Routers

are used to connect different broadcast domains to each other

↳ Commonly ^{used to} connect a LAN to a WAN (site to site or the internet)

↳ Forwards traffic based on IP Addresses in packets

↳ Can usually provide DHCP

POE (Power Over Ethernet)

allows you to power devices using just an Ethernet cable.

• A POE switch is required if you want to power many PoE devices.

• PoE devices are manufactured and sold with PoE built-in as a feature.

• PoE injectors can be used to power a single PoE device if a PoE switch is NOT available.

• PoE standards operate at different wattages, verify which is required for your devices.

Hub

→ A Hub is a legacy device used to connect and manage wired communications in a LAN.

↳ Communicate by broadcasting.

↳ Uses CSMA/CD to manage the collisions.

Switch

A switch is used to connect and manage wired communications in a LAN as well.

↳ Forward Frames based on MAC addresses

↳ Managed switches vs Unmanaged switches

• Managed switches can be configured

↳ Used in enterprise LANs to meet their needs for enforcing policies.

↳ Provides additional functions like VLANs, port security, DHCP snooping, and dynamic ARP inspection.

↳ Expensive.

• Unmanaged switches can not be configured

↳ Used in SOHO networks

↳ Lower cost

DSL Modem

• Digital subscriber Line (DSL)

↳ Type of internet that uses telephone lines

• Connect a network to a DSL connection.

Optical Network Terminal (ONT)

Converts the optical signal coming through the fiber into separate signals for TV, voice, and data.

Software-defined networking (SDN)

An approach to network management that enables dynamic, programmatically efficient network configuration in order to improve network performance and monitoring, making it more like cloud computing than traditional network management.

→ Disassociating the forwarding process of network packets (data plane) from the routing process (control plane).

→ Uses a controller to manage network traffic,