

Computer Networks 1

Lab 1

Network Devices

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I. Objectives:

- Get to know basic network devices
- Understand functions of network devices
- Able to connect different network devices together to form a simple network

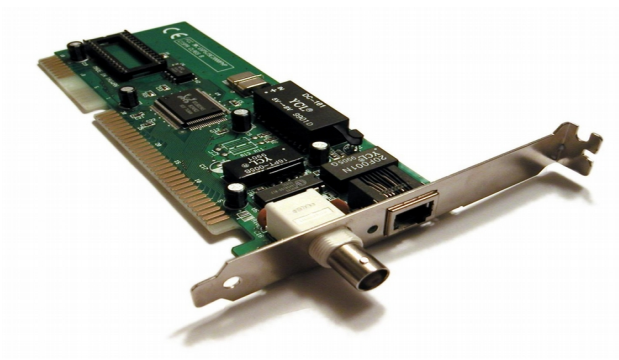
II. Content

1. Get to know network devices:

- ✓ Network Interface Card (NIC)
- ✓ Cables
- ✓ Hub
- ✓ Switches
- ✓ Routers
- ✓ Access Points
- ✓ Modems

2. Understanding functions of network devices

a. Network Interface Card (NIC)



NIC functions: provides a computer with a dedicated, full-time connection to a network by implementing the [physical layer](#) circuitry necessary for communicating with a [data link layer](#) standard, such as [Ethernet](#) or [Wi-Fi](#)

Code of NIC processors: _____

Check NIC of a computer, what is its MAC address? Unique identifier assigned to NIC for communicating with Datalink layer.

Cable to connect NIC to a network:

Type: Ethernet cable

Standard: CAT5, CAT6

b. Hubs



Roles of hub in a network: Connect computers belong to a network

Main characteristics: operate at Layer 1. When a host sends a packet to another host inside the network, Hub merely forwards all bit of that packet to every other hosts.

Weaknesses of hub: Few connections established, less security

Hub ports: RJ45

c. Switches



Roles of switches in a network: Similar with Hub but more advanced

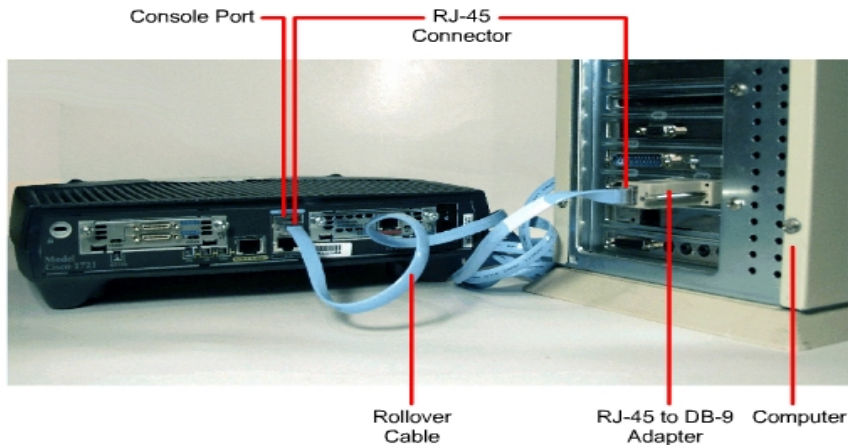
Main characteristics of switches: operate at 2nd layer, send packet to appropriate host

Differences between hubs and switches: more connections allowed, rather than send bits to every other hosts, Switch sends packet to exactly host.

Weaknesses of switches: expensive, errors occurring are difficult to trace

Switch ports: RJ45

d. Routers



Roles of routers in a network: route the packet based on its destination embedded

Main characteristics of routers:

Differences between routers and switches: Switch operates at 2nd layer, while it is 3rd layer for Router

Router ports: RJ45

d. Access Points



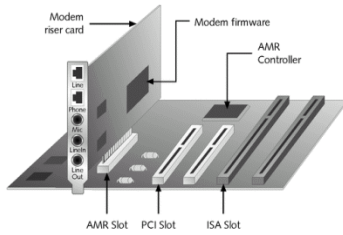
Roles of access points: make it available for devices to connect to Internet wirelessly, create WLAN

Main characteristics of access points:

Access point's interfaces:

Compare access point and other networking devices mentioned above:

e. Modem



Differentiate:

- Dial-up modem: phone line plug directly to modem, no frequency splitter
- ADSL Modem: phone line plug directly to modem, have frequency splitter
- Cable Modem: have frequency splitter component that splits analog signal and Internet signal

For each type of modem describe its roles and characteristics: _

3. Connecting network devices:

Identify the type of network cable can be used for below network connections:

- Computer and hub : Ethernet cable
- Computer and switch: Ethernet cable
- Computer and router: Ethernet cable
- Computer hub and hub: Ethernet cable
- Hub and switch: Ethernet cable
- Hub and router: Ethernet cable
- Switch and switch: Ethernet cable
- Switch and router: Ethernet cable
- Router and router: Ethernet cable