Lab Exam Preparation

Lab-1 (Network cabling)

Common Networking/Network cables:

(1) Coaxial cable.

Use: cable operators, telephone company, internet provider etc.

(2) Unshielded twisted pair.

Use: UTP cable is used not only for networking but also for the traditional telephone (UTP-cal 1).

(3) Fiber optic.

Use: Optical fiber is used by telecommunications comma companies to transmit telephone signals, Internet communication and cable television signals.

UTP categories:

C-1 : Voice only (Telephone)

C-2 : Local talk → 4Mbps

C-3 : Ethernet → 10Mbps

C-4 : Token Rigning → 20 Mbps

C-5 : Fast Ethernet → 100 Mbps

C-5e : Gigabit Ethernet → 1000 Mbps

C-6 : Gigabit Ethernonet → 2500 Mbps

RJ45 connecton :

It is the most common twisted-pair connecton for Ethernet cables and netwonks.

→ "RJ → Registered Jack"

→ It has "8 pins".

→ Used for terminating cat5e or cat6 twisted pair cable.

Making connection – Tools

- Cat 5e cable
- RJ45 connectons
- cable stripper
- Scissons
- crimping tools

Making connection – Steps

(1)

→ Strip cable end

i) Strip 1-1½" of insulating sheath

ii) Avoid cutting into conducton insulation

(2)

→ Untwist wire ends

i) Sort wire by insulation colons.

(3)

→ Arrange wires

④

→ Trim wires to size

i) Trim all wires evenly.

ii) Leave about $\frac{1}{2}$" of wire exposed.

⑤

→ Attach connecton

i) Maintain wire onden, left-to-right with RJ45 tab facing downward.

⑥

→ Check

⑦

→ Crimp

⑧

→ Test

Network cable connection:

① Straight-Through cable connection

→ Same type of colon code sequence in both sides.

② Crossover cable connection

→ In one side – colon code ~~connection~~ sequence as like straight through and there will be some changes in the other side.

Straight through

Side 1:									(same for two side)
Side 2:	WO (1)	O (2)	WG (3)	B (4)	WB (5)	G (6)	WBr (7)	Br (8)	

Crossover

Side 1:	WO	O	WG	B	WB	G	WBr	Br	(Interchange) W
Side 2:	WG (1)	G (2)	WO (3)	B (4)	WB (5)	O (6)	WBr (7)	Br (8)	(1↔3, 2↔6)

** Left pin will be no-1 and right pin will be no-8.

Two different device → (PC – Router)
↓
Straight - Through

Two same device → ~~Cross~~ (PC-PC)
↓
Cross over connection

Lab-2 (Logical Address)

Two types:
① IP Version - 4 (IPV4)
② IP version - 6 (IPV6)

IPV4 characteristics:
- 32 bits long.
- Unique.
- Universal.
- 4 fields / blocks, 8 bits per field / block.
- Notation / representation: (i) Binary
  (ii) Decimal

Example: 192.100.10.0 = 1100 0000.0110 0100.0000 1010.
0000 0000

Classful Logical Address:

There are total five classes:

① Class A: range: 0-127
↓
Uc
Fixed bit: 0 (1 bit)

② Class B: range: 128-191
↓
Unicast communication Fixed bit: 10 (2 bit)

③ Class C: range: 192-223
↓
Uc
fixed bit: 110 (3 bit)

④ Class D: range: 224 - 239
↓
Multicast communication fixed bit: 1110 (4 bit)

⑤ Class E: range: 240-255
↓ fixed bit: 1111 (4bit)
Reserved for future use
(Broadcast communication)

Class A:

→ Net bits - 8

→ Host bits - 24

Default mask:

Net bit = 1
Host bit = 0

255.0.0.0

Class B:

→ Net bits - 16

→ Host bits - 16

⟶

255.255.0.0

Class C:

→ Net bits - 24

→ Host bits - 8

⟶

255.255.255.0

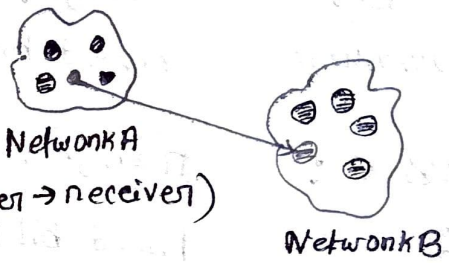
**

Unicast Vs Multicast Vs Broadcast

Unicast communication:

Uc is useful when there is a participation of single sender and single recipient.

* One-to-one transmission



Ex: Browsing a website
(webserver → sender, My computer → receiver)

Multicast communication:

Mc In multicasting, one/more senders and one/more recipients participate in data transfer traffic.

* One-to-several
* One host sends data to multiple host
* One packet to many receivers
  ↳ like mailing list (one mail to many receivers)

Ex: video server sending out networked Tv channels

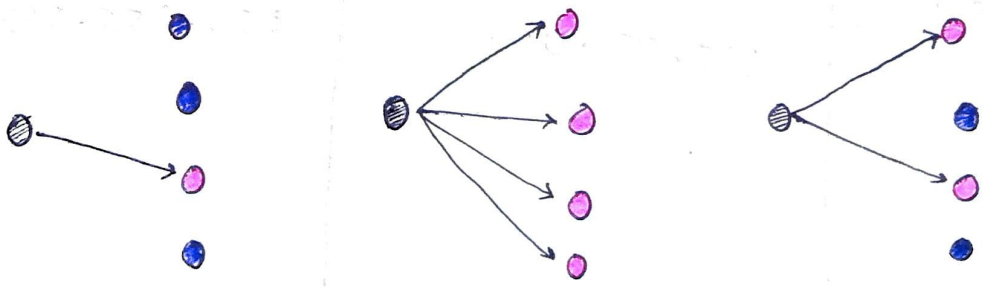
Broadcast communication:

In Broadcast communication, there are a large number of receivers corresponding to a single transmitter.

Ex: Radio /~~level~~ television

* One-to-all

Unicast | Multicast | Broadcast



Lab-3 (Simple Network configuration)

* A Network can be defined as a group of computers and other devices are connected in some ways so as to be able to exchange data.
* IP address: IP address is an address having information about how to reach a specific host, especially outside the LAN. It's a 32 bit unique address having an address space of 2^{32}.
* End devices: PC, Laptop, Tv etc.
* Hub: A simple network device.
* Connection: Automatic choose (copper. Straight-Through)

Lab-4 (HTTP, SMTP, DNS Server Config)

HTTP: The main function of a HTTP server is to store, process and deliver web pages to clients.

SMTP: Simple Mail Transfer Protocol is used to send, receive, and/or relay outgoing mail between Sender and receivers.

DNS: The Domain Name System (DNS) connects URLs with their IP address. It allows people to search for websites and send emails using familiar names.
Ex: Udemy.com.

Lab-5 (VLAN config)

A VLAN (Virtual Local Area Network) is a subnetwork which can group together collections of devices on separate physical LANs. VLAN is virtual extention of LAN.

→ It help to improve overall perfonmance of a network.

→ It provide security on large networks.

CLI command Modes (3 modes):

1. User mode (Switch >)
2. Privilege mode (Switch > en) → Switch #
3. configuration mode (Switch # config t) →

(Swich (config) #)

Lab-6 (RIP config)

RIP (Routing Infonmation protocol) is a dynamic routing protocol. ~~which~~ It used to find the best route on path from end-to-end (source to destination) over a network by using a routing metric /hop count algonithm.

CLK (Clock Frequency → 64000 (we set it)