

# 1. My PC's Internet & Gateway

Note:

Introduction to TCP / IP

Module 1 : My PC's Internet & Gateway

- My PC's Internet Setup

⇒ IP Address

- IP address is assigned to an interface port
- PC's Interface IP address:  
165.132.126.159
- IPv4 32 bit (4 byte) address format  
8 bits = 1 byte = 1 Octet

⇒ IP Address Assignments

- Computer or Smart phone may have multiple interfaces and therefore may need multiple IP addresses.
- Example: Smart phone need multiple IP addresses
  - ⇒ Mobile communication  
2G ; 3G ; 4G
  - ⇒ Wi-fi  
IEEE 802.11 a/b/g/n/ac (2.4, 5 GHz)
  - ⇒ Bluetooth

⇒ Subnet Mask

- Internet is divided into Subnets, and Subnets are divided into small Subnets.
- Subnet mask is base on the size of the subnet that the Client (PC) is connected to.
- IPv4 Subnet mask is formed by 32 bits 1s or 0s in a sequence from Left (MSB) to Right (LSB)
- Subnet mask is used to mark the IP address to easily determine if the packet belongs to this subnet or not.

#### → Default Gateway

- is the dedicated Internet Router that will send and receive all Internet IP packets for this PC.
- PC will access the Internet

#### → DNS (Domain Name Server)

- DNS is a server that converts hostnames into IP addresses.

### - Automatic Internet Setup using DHCP

#### → DHCP (Dynamic Host Configuration Protocol)

- DHCP enables a Computer / Smartphone to automatically contact the local DHCP server and request for an IP address and networking parameters to connect to the Internet.

#### → Importance of DHCP

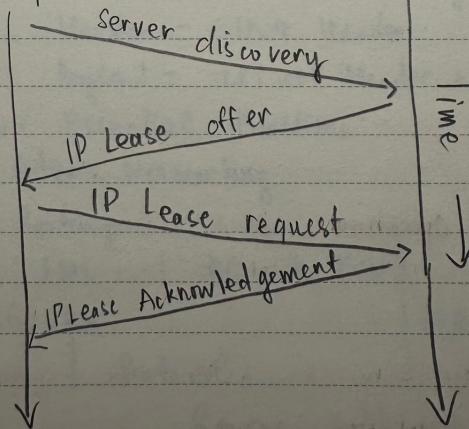
- DHCP is very easy to use → all automatic
- DHCP also enables reuse of IP addresses.

#### → DHCP Operations

- DHCP operates on a Client-Server model
- DHCP Server manages the following pool of IP addresses

Client info is kept on the DHCP Server

Client  
(PC, Smartphone)                                  DHCP  
    Server.



### - IP Gateway / Router Configuration

→ Subnet for Room A (100 PCs)

• Room A (100 PCs) : 100 IP Addresses

• Network Destination : 1 IP Addresses ← lowest IP

• Broadcast IP : 1 IP Addresses ← highest IP

• Gateway Interface : 1 \_\_\_\_\_ ← Second highest

→ Subnet : 255.255.255.128

→ Required = 103 addresses  $\leq 128 - 2$

IP address for Room A : 165.132.9.\*

→ CIDR : 165.132.9.0/25

### - IP Routing table.