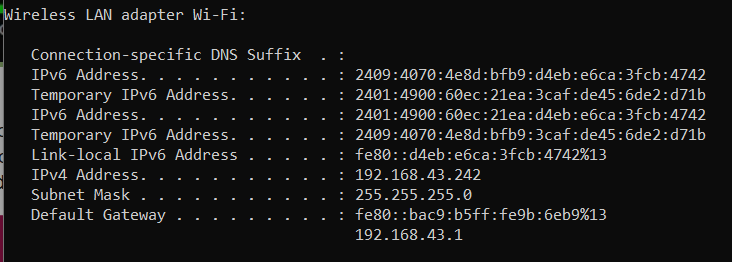
**C\_Network\_Assignments\_1**

**Computer Networks – Internet Protocol:**

**1a. Find out the IP address of your machine.**

Ans:Win+R->cmd->ipconfig



**b. Identify its CLASS**

Ans: Class c

**c. Identify its category – Private or Public**

Ans: Public IP Range: 192.0.0.0 to 223.255.255.0

First octet value range from 192 to 223

Private IP Range: 192.168.0.0 to 192.168.255.255

192.168.43.242 is private category of class c IPv4 address

**2.What is the Network Mask of your machine. Use it to find the Network ID of your machine.**

Ans: The network ID is found by logically ANDing the binary form of the IP address with the binary form of the subnet mask for the network.

IP Address: 192.168.43.242

Network Mask: 255.255.255.0

Network ID: (192.168.43.242)&&(255.255.255.111100100)

Binary form of 192.168.43.242-> 1100 0000 1010 1000 0010 1011 1111 0010

Binary form of 255.255.255.0-> 1111 1111 1111 1111 1111 1111 1111 1111

1100 0000 1010 1000 0010 1000 1111 0010

Network ID of my machine is: 192.168.40.242

**3.The IP address and Mask combination, written in prefix/length notation is given below:**

* + 1. **Device A: 172.16.17.30/20**
    2. **Device B: 172.16.28.15/20**

**Find out if both the devices belong to the same subnet or not?**

**Ans:** Yes, they are belongs to same subnet as subnet of both devices are 20. That means first 20 bits(from left to right) are 1.

1. **What is the need for an IP address? which devices use this address?**

Ans:An IP address tells computers how to find a certain device within a computer network. An IP address is like an address label for information packets. For each network your computer is connected to, it has a unique IP address on that network. So, one device can have several IP addresses at the same time The devices which are able to connect internet, they all have ip address

1. **What is IPv4, IPv6?**

Ans: **IPv4:** IPv4 (Internet Protocol version 4) is the standard address format that lets all machines on the internet communicate with one another. IPv4 is written as a 32-bit string of digits, and an IPv4 address is composed of four numbers, each between 0 and 255, and separated by periods.

**IPv6:** IPv6 is an Internet Layer protocol for packet-switched inter networking and provides end-to-end datagram transmission across multiple IP networks, closely adhering to the design principles developed in the previous version of the protocol, Internet Protocol Version 4 (IPv4).

The IP version 6 can handle packets more effectively, enhance performance and boost security. It helps internet service providers to decrease the size of routing tables by making them more hierarchical.

1. **What is Mac address? What is its length? Which devices use this address?**

Ans: MAC stands for Media Access Control. It is a unique identifier for network interfaces. It is used as a network address for most IEEE 802 network technologies. Sometimes it is known as the burned-in address (BIA) or the Ethernet hardware address (EHA). Among its applications are the Ethernet, 802.11 wireless networks and Bluetooth. MAC addresses can also be used in data recovery to connect to a wireless device.

1. **What are the layer 2 and layer4 protocols?**

Ans: Layer 4 is Transport Layer. Protocols used in layer is: TCP and UDP

Layer 2 is Data Link Layer. Protocols used in layer is: Synchronous Data Link Protocol (SDLC), High-Level Data Link Protocol (HDLC), Serial Line Interface Protocol (SLIP), Point to Point Protocol (PPP)

1. **Devices below work at which layer?**
   1. **Routers b. Gateways c. Bridge d. Switches**

Ans: Routers- Network Layer

Gateways- Network Layer

Bridge- Data Link Layer

Switches- Data Link Layer or Network Layer

1. **What is a socket? What are the different types of sockets?**

Ans: **Socket:** Sockets allow communication between two different processes on the same or different machines. To be more precise, it's a way to talk to other computers using standard Unix file descriptors.

**Types of Socket:**

A Unix Socket is used in a client-server application framework. A server is a process that performs some functions on request from a client. Most of the application-level protocols like FTP, SMTP, and POP3 make use of sockets to establish connection between client and server and then for exchanging data.

1. Stream Sockets
2. Datagram Sockets
3. Raw Sockets
4. Sequenced Packet Sockets
5. **Give few eg for applications based on protocols below.**
   1. **TCP b. UDP**

Ans: Examples of TCP: FTP, HTTP, SMTP

Examples of UDP: Online Games, Video Conferencing, Voice over IP, DNS

1. **What is the port number used for the following protocols?**
   1. **tftp b. smtp c. dns d. dhcp e. telnet f. ssh**

Ans:

|  |  |  |  |
| --- | --- | --- | --- |
| ****PROTOCOLS (SERVICE NAMES)**** | ****PORTS NUMBERS**** | ****TRANSPORT PROTOCOLS**** | ****MEANINGS**** |
| Trivial File Transfer Protocol (TFTP) | |  |  | | --- | --- | | 69 |  | | UDP | TFTP is typically used by devices to upgrade software and firmware and that include cisco. |
| Simple Mail Transfer Protocol (SMTP) | 25 | TCP | It is a communication protocol which is used to transmit email messages over the internet to the destination server. |
| Domian Name System (DNS) | 53 | TCP and UDP | It is used in the performance of one simple task of converting IP address  To domain names that everyone can easily understand. |
| Dynamic Host Configuration Protocol (DHCP) | 67 and 68 | UDP | It is a kind of service used in the client and server model. |
| Telnet | 23 | TCP | It is the used for remote management protocol for managing network devices. |
| Secure Shell | 22 | TCP and UDP | It is a cryptographic network protocol used to secure data communication. |

1. **Identify the class (A, B, ..) and category (Private or public) of the following ipaddress.**
   1. **192.168.1.3**

Ans:Class C- Private Category

* 1. **172.30.5.5**

Ans: Class B- Private Category

1. **For the foll. ip address, find the a) network address b) broadcast address (Hint: in node ip address, set all the host bits to 1) c) first usable address d) last usable address**
   1. **147.144.1.218/16**
   2. **192.168.1.3/24**

**Ans:147.144.1.218/16**

**Address-**147.144.1.218-10010011.10010000.00000001.11011010

**Netmask-**255.255.0.0 = 16-11111111.11111111.00000000.00000000

**Wildcard-**0.0.255.255-00000000.00000000.11111111.11111111

**Network-**147.144.0.0/16-**10**010011.10010000.00000000.00000000-Class B

**Broadcast-**147.144.255.255-10010011.10010000.11111111.11111111

**First IP-**147.144.0.1-10010011.10010000.00000000.00000001

**Last IP-**147.144.255.254-10010011.10010000.11111111.11111110

**Hosts/Net-**65534-nnnnnnnn.nnnnnnnn.hhhhhhhh.hhhhhhhh

**192.168.1.3/24**

**Address-**192.168.1.3-11000000.10101000.00000001.00000011

**Netmask-**255.255.255.0 = 24-11111111.11111111.11111111.00000000

**Wildcard-**0.0.0.255-00000000.00000000.00000000.11111111

**Network-**192.168.1.0/24-**110**00000.10101000.00000001.00000000-Class C

**Broadcast-**192.168.1.255-11000000.10101000.00000001.11111111

**First IP-**192.168.1.1-11000000.10101000.00000001.00000001

**Last IP-**192.168.1.254-11000000.10101000.00000001.11111110

**Hosts/Net-**254-nnnnnnnn.nnnnnnnn.nnnnnnnn.hhhhhhhh-Private

1. **What is NAT and port forwarding?**

Ans: **NAT:**

NAT is ****N****etwork ****A****ddress ****T****ranslation. Port Address Translation (PAT) — Each host on a LAN has its IP address translated into the router’s WAN side IP with a different port number. This makes each session unique. It is the most common form of NAT. There are a total of 65536 ports. Port Forwarding — Deals more with incoming traffic.

NAT offers three primary functions:

1. Functions as a form of firewall by masking internal IP addresses.
2. Allows a business to use additional internal IP addresses.
3. Enables a firm to securely set up a device on the Internal Network for Internet access.

**Port forwarding:**

Port forwarding, also known as port mapping, is a network address translation (NAT) program that redirects communications requests from an address and port number combo to another while the packets are passing through an access layer, such as a wireless router.