Unit-3

IP V4

* IP corresponds to the network layer in OSI Model.
* It provides Connectionless Service to transport layer.
* IPV4 addressing has fixed header size.
* IPV4 header size is of 32 bit
* IPV4 addresses are unique. So two device in internet cannot have same IP address at the same time.
* The address structure was originally defined by two types they are
  1) host id
  2) Network id.
* Network id identifies the network connected to
* Host id. identifies the actual host

Address Space:

* A address space is the total Number of addresses used by the protocol

* protocol uses N bits to define an address.

* IPv4 addresses uses 32 bit. which means 2^{32} or 4,294,967,296.

* IP addresses are usually written in dotted decimal. notation So that they can Communicated Conveniently by people.

Sample IP address:

10000000. 10000111

* 32-bit IP address is structured or hierachical address.

* There are three method for depicting an IP address.

1). Dotted - decimal 137.57.30.57

2) Binary, 10000010.00111001.00011110.
00111000.

3). Hexadecimal., 8B.39.C2.43.

* IPV4 addressing is classified into 2 types they are classful addressing and classless addressing.

Classful addressing:

* This IP address structure is divided into five types.

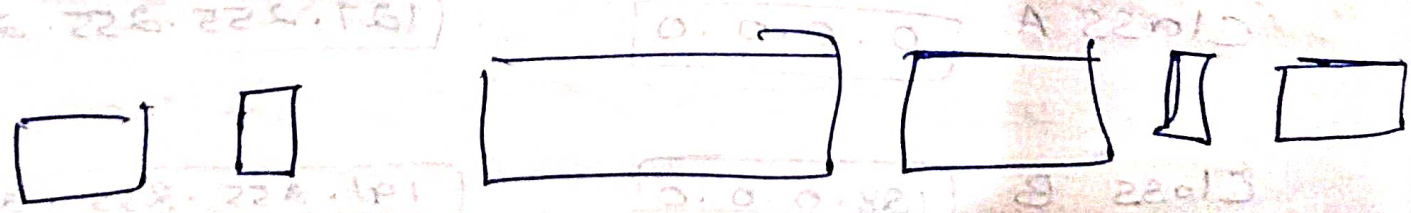
Class A, B, C, D, E.

	from	To
Class A	0.0.0.0	127.255.255.255
Class B	128.0.0.0	191.255.255.255
Class C	192.0.0.0	223.255.255.255
Class D	224.0.0.0	239.255.255.255
Class E	240.0.0.0	255.255.255.255

* Class A - large organization
* Class B - Mid-size organization
* Class D - Multicast services.

Classless Addressing:

* This addressing mode does not belongs to any classes.
* The entire address space is divided into blocks of different sizes.
* Block size can be small or large.



Architecture of classless addressing.

IPV6:

* It provides host - to host communication.
* Larger address space.
* Support for resource allocation
* Highly Secure.
* Header Size is 128 bits.
* Supports auto configuration
* Supports relatime application
* Throughput and delay is less.

Es:

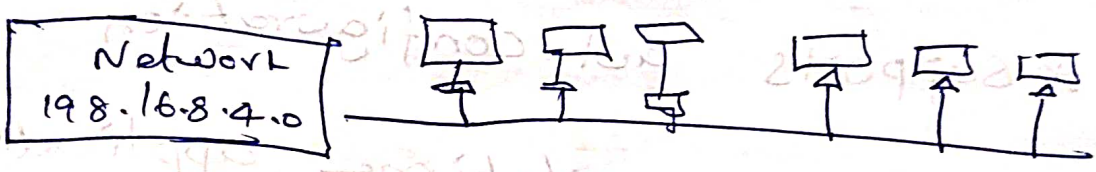
8000 : 0000 : 000 : 000 : 0123 : 4657 : 89AD : CDEf

3) Subnetting.

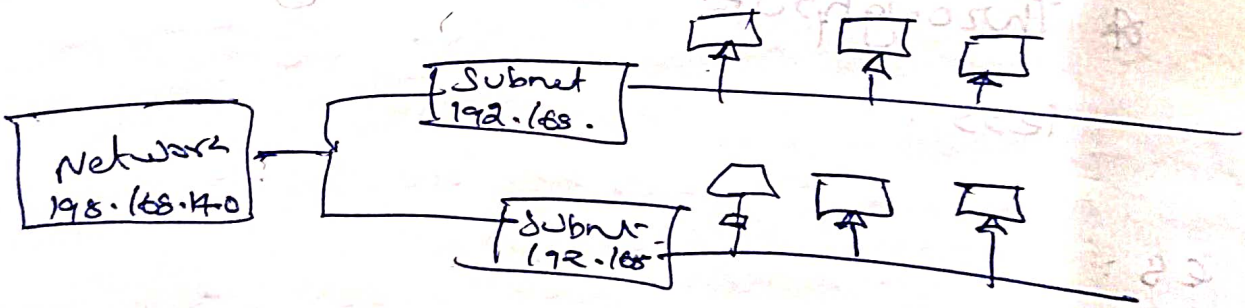
* Subnetwork or Subnet is a logical subdivision of an IP network.

* The pratica of dividing a network into two or more networks is called subnetting.

Network.



Subnet:



* Reduced Network traffic
* Optimize Network.
* Facilities spanning large geographic distance.
* Simplified network Management

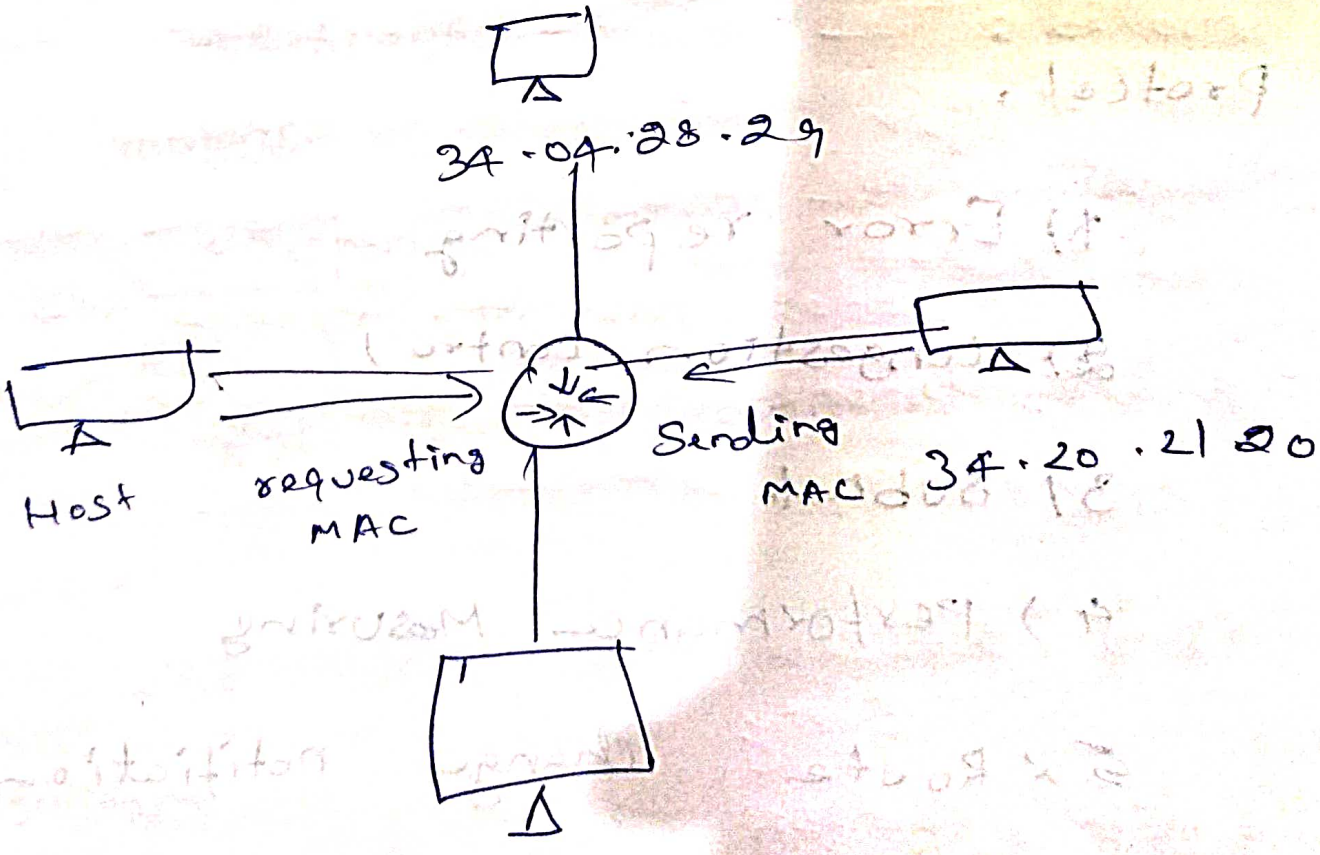
4) ARP:

* ARP stands for Address resolution Protocol.

* It is used to find or resolve IP addresses to MAC addresses

* MAC addresses is a physical address of device

* MAC is global unique address.



5) RARP.

* RARP Stands for Reverse addressing resolution protocol

* It performs the reverse function of ARP protocol.

* Broadly RARP is replaced by DHCP.

6) ICMP.

* Internet Control Message protcol.

1) Error reporting
2) congestion control
3) subnet
4) performance Measuring
5) Route change notification
6) Reachbility testing