

Lecture 10.5 (Basics of IP Addressing)

1. IP Address is used to identify a host using 32 bits having 4 bytes
2. A host must have a NIC (Network Interface Card)

1 Subnet Mask

Determines what part of the IP address is the network part and what part is the host part.

2 Network Address

This is given by $N0 \dots 0$ where N is the network part in bits

3 Classes of IP Addresses

- a. Class A (1-126, 127 reserved for loopback address)
 - N.H.H.H policy, where only the first byte is the network byte
 - Subnet mask = 255.0.0.0
 - Total number of hosts = $2^{24} - 2$
- b. Class B (128-191)
 - N.N.H.H
 - Subnet mask = 255.255.0.0
 - #hosts = $2^{16} - 2$
- c. Class C (192-223)
 - N.N.N.H
 - Subnet mask = 255.255.255.0
 - #hosts = $2^8 - 2$
- d. Class D (224-239)
 - used for multicasting
- e. Class E (240-255)
 - used for experimenting

4 Private IP Addresses

- a. Class A: 10.0.0.0
- b. Class B: 172.16.0.0 - 172.31.0.0
- c. Class C: 192.168.0.0 - 192.168.255.0

5 Types of Addressing

MAC address is 12 hexadecimal values

5.1 Unicast Address

IP + MAC address uniquely determines the address

5.2 Broadcast Address

This is given by $N1 \dots 1$ where N is the network part in bits and MAC address is all F's

5.3 Multicast Address

IP address in Class D and MAC address begins with 01-00-5E

6 Classless InterDomain Routing (CIDR)

IP/x is used where x determines the number of bits which represent the network address

7 Dynamic IP Addressing

- 1. Dynamically assigns an IP address
- 2. Uses DHCP (Dynamic Host Configuration Protocol)
- 3. IP addresses are leased for some period of time