



**Ministry of Higher Education and Scientific
Research Al-Mustaqbal University College
Department of Technical Computer Engineering**

Lecture Number: 4

Computer Networks 3rd Stage

Lecturer: Dr. Hussein Ali Ameen


hussein-awadh@mutaqbal-college.edu.iq

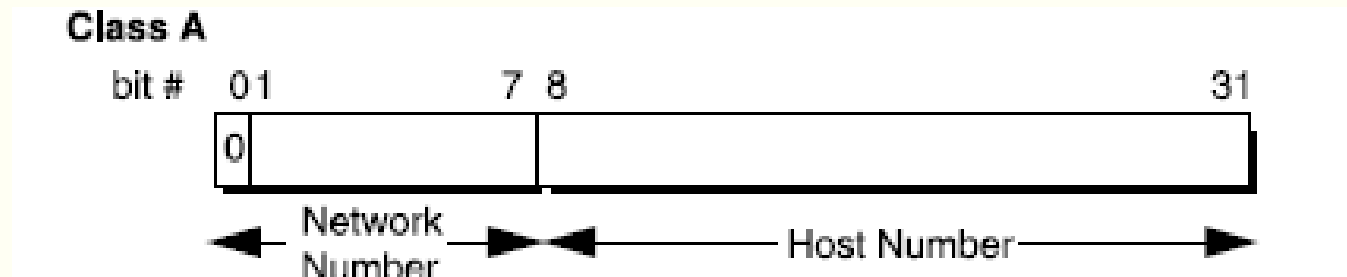
2021-2022

Primary Address Classes

Class A Networks (/8 Prefixes)

Network Prefix

- 8-bit (one byte).
- highest order bit set to 0
- 7-bit network number,
- 126 (2^7-2) is maximum networks 
- 0.0.0.0 is reserved for the **default route**
- 127.0.0.0 is reserved for the “loopback”

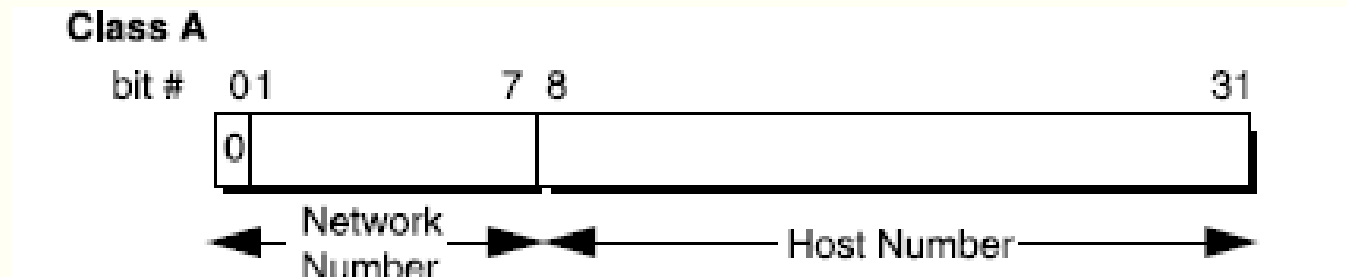


Primary Address Classes

Class A Networks (/8 Prefixes)

Host portion

- 24-bit (three bytes).
- 16,777,214 ($2^{24} - 2$) is maximum host per network.
- all zeros is for this network
- all ones is for broadcast

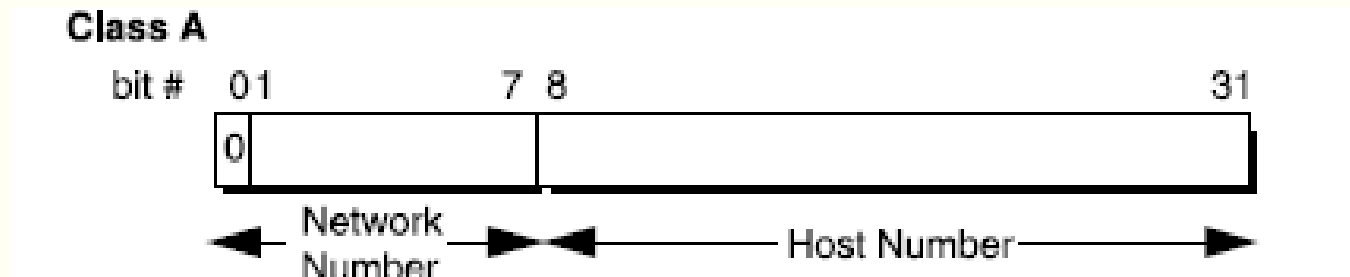


Primary Address Classes

Class A Networks (/8 Prefixes)

/8 address block

- 2^{31} (2,147,483,648) Individual addresses
- 50% of the total IPv4

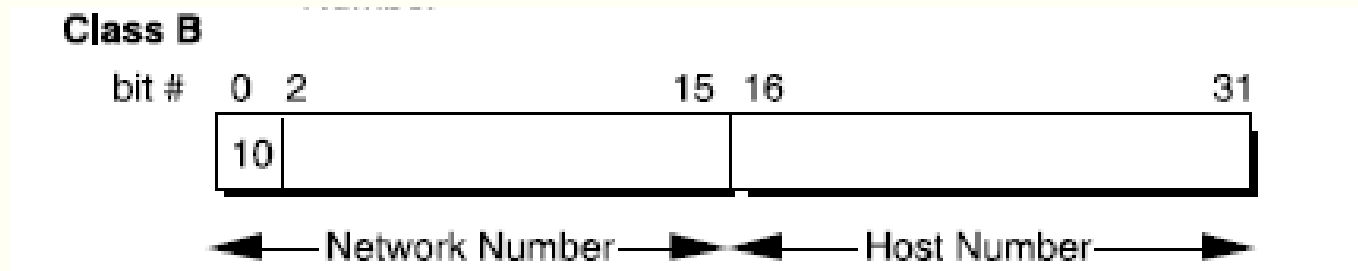


Primary Address Classes

Class B Networks (/16 Prefixes)

Network Prefix

- 16-bit (two bytes).
- highest order bits set to 1-0
- 14-bit network number,
- 16,384 (2^{14}) is maximum networks



Primary Address Classes

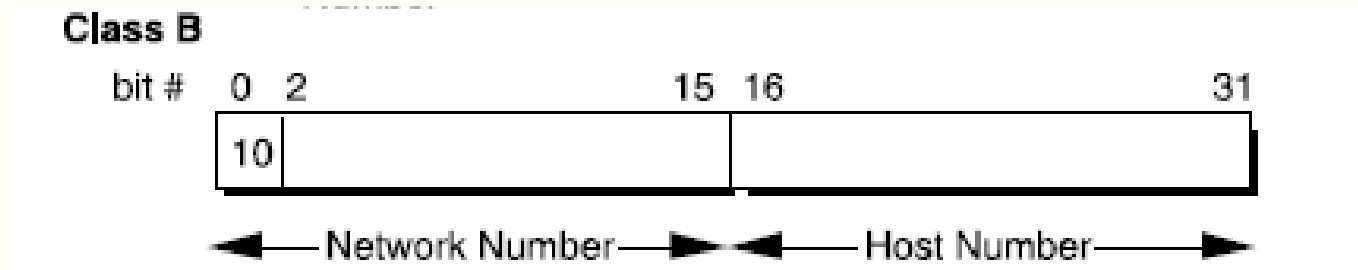
Class B Networks (/16 Prefixes)

Host Number

- 16-bit (two bytes).
- 65,534 ($2^{16}-2$) hosts per network

/16 address block

- 2^{30} (1,073,741,824) addresses
- 25% of the total IPv4

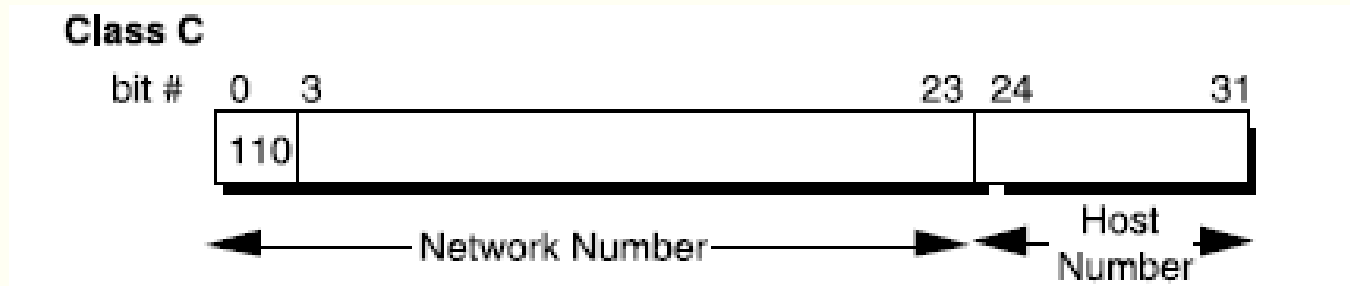


Primary Address Classes

Class C Networks (/24 Prefixes)

Network Prefix

- 24-bit (three bytes).
- highest order bits set to 1-1-0
- **21-bit** network number
- 2,097,152 (2^{21}) is maximum networks



Primary Address Classes

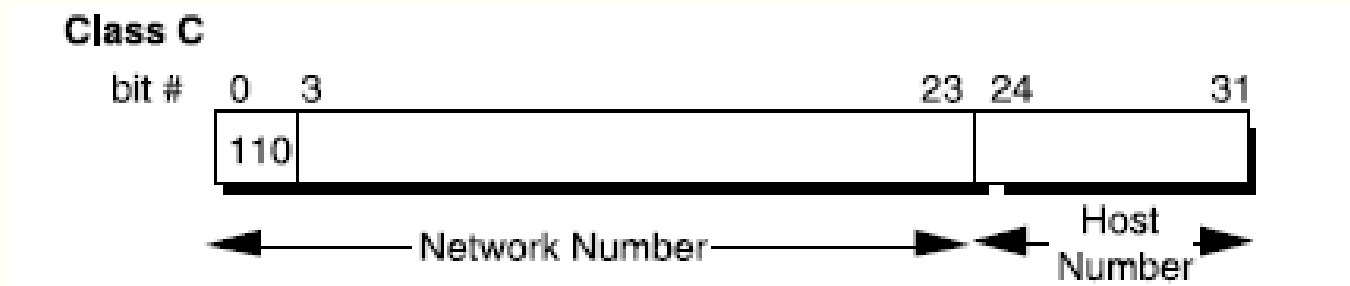
Class C Networks (/24 Prefixes)

Host Number

- 8-bit (one bytes).
- 254 (2^8-2) hosts per network

/24 address block

- 2^{29} (536,870,912) addresses
- 12.5% of the total IPv4



Primary Address Classes

Address Class	Dotted-Decimal Notation Ranges
A (/8 prefixes)	1.xxx.xxx.xxx through 126.xxx.xxx.xxx
B (/16 prefixes)	128.0.xxx.xxx through 191.255.xxx.xxx
C (/24 prefixes)	192.0.0.xxx through 223.255.255.xxx

Other Classes

- Class D addresses (1-1-1-0) support IP Multicasting addresses
- Class E addresses (1-1-1-1) experimental use

Network Terms

The different terms and uses associated with network addresses :

- **Loopback** Used to test the IP stack on the local computer.
- **Broadcasts** These are sent to all nodes on the network.
- **Unicast** these are used to send packets to a single destination host.
- **Multicast** sent a packets to many devices on different networks.

Summery

Remember the Class A range. The IP range for a Class A network is 1–126. This provides 8 bits of network addressing and 24 bits of host addressing by default.

Remember the Class B range. The IP range for a Class B network is 128–191. Class B addressing provides 16 bits of network addressing and 16 bits of host addressing by default.

Remember the Class C range. The IP range for a Class C network is 192–223. Class C addressing provides 24 bits of network addressing and 8 bits of host addressing by default.

Remember the Private IP ranges. Class A private address range is 10.0.0.0 through 10.255.255.255. Class B private address range is 172.16.0.0 through 172.31.255.255. Class C private address range is 192.168.0.0 through 192.168.255.255.