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DEPARTMENT OF MCA

Course Name : 19CAT603 - DATA COMMUNICATION AND NETWORK

Class : I Year / I Semester

Unit III – NETWORK AND SWITCHING, NETWORK DEVICES

Topic 3 – IP Addressing

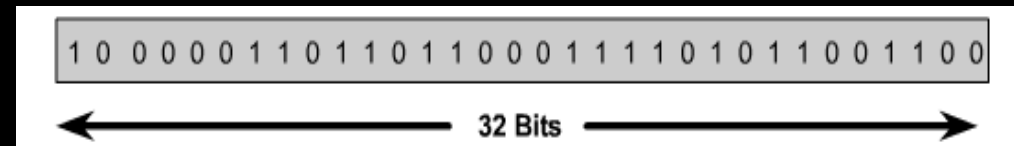


IP Addressing



What is an IP address

- An IP address is a 32-bit sequence of 1s and 0s.
- A way to identify machines on a network
- A unique identifier
- A numerical label





IP usage

- Used to connect to another computer
- Allows transfers of files and e-mail



What is an Internet Protocol

- Protocol used for communicating data
- Across a packet-switched



Services provided by IP

- Addressing
- Fragmentation



Part of IP Address

- Network Part
- Local or Host Part



IP Structure

- IP addresses consist of four sections
- Each section is 8 bits long
- Each section can range from 0 to 255
- Written, for example, 128.35.0.72



IP structure

- 5 Classes of IP address A B C D and E
- Class A reserved for governments
- Class B reserved for medium companies
- Class C reserved for small companies
- Class D are reserved for multicasting
- Class E are reserved for future use

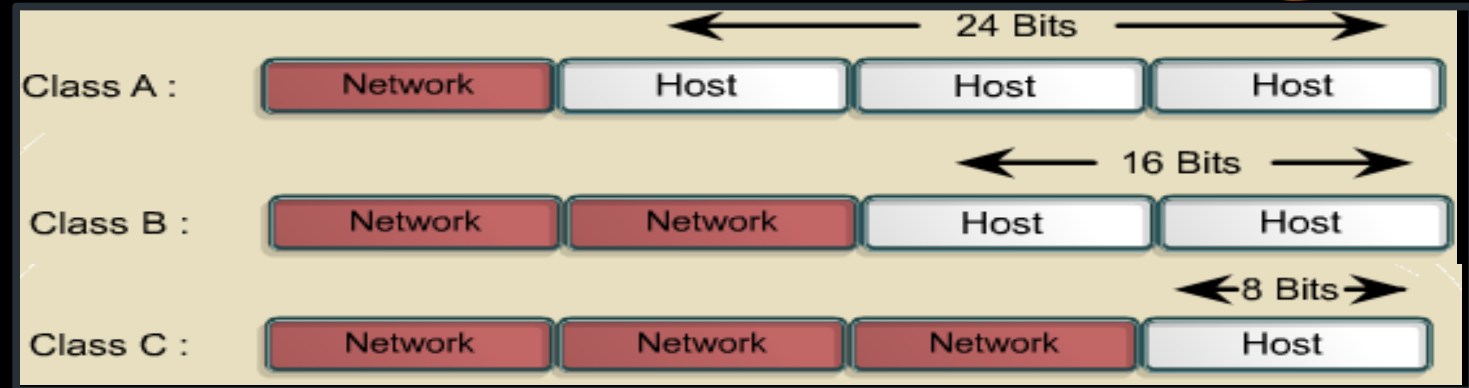


IP ranges

IP Range



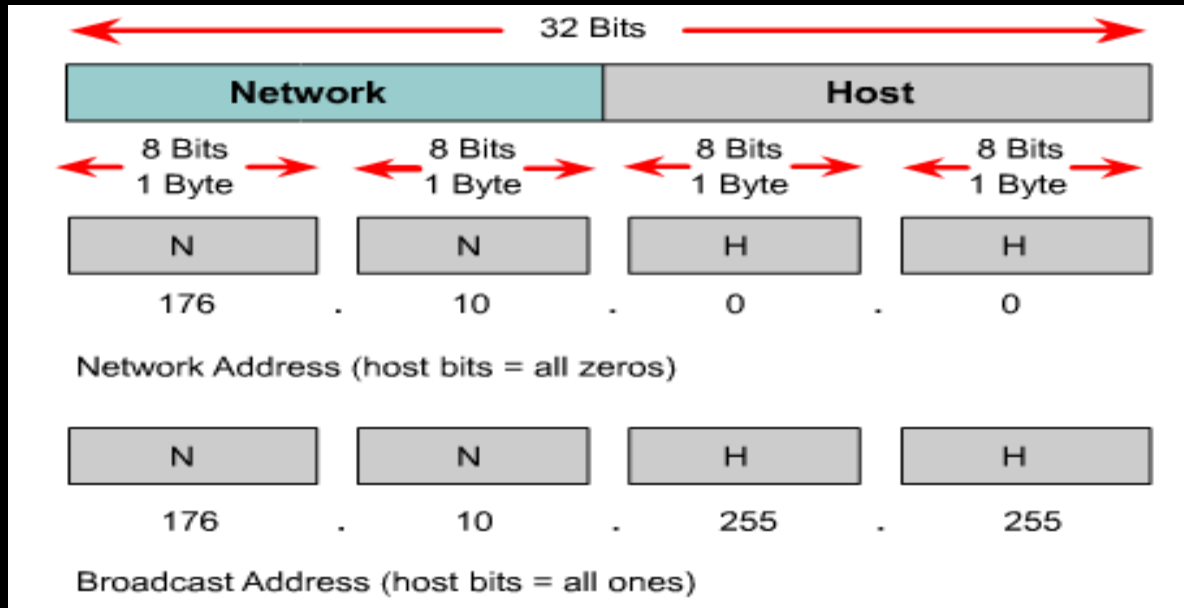
IP addresses are divided into classes A, B and C to define large, medium, and small networks.



Address Class	High-Order Bits	First Octet Address Range	Number of Bits in the Network Address	Number of Networks	Number of Hosts per Network
Class A	0	0-127	8	126	16,777,216
Class B	10	128-191	16	16,384	65,536
Class C	110	192-223	24	2,097,152	254
Class D	1110	224-239	28	N/A	N/A



Example





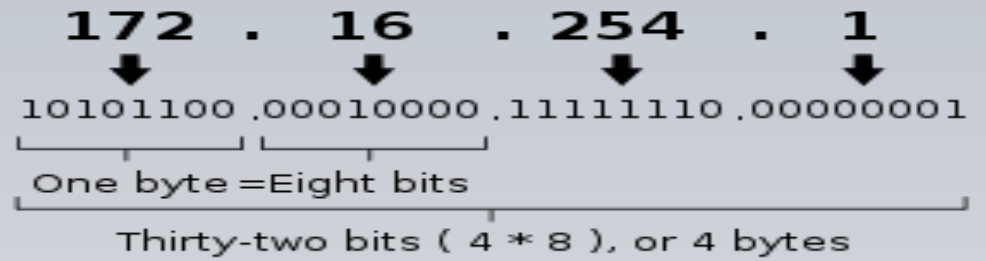
How to Calculate



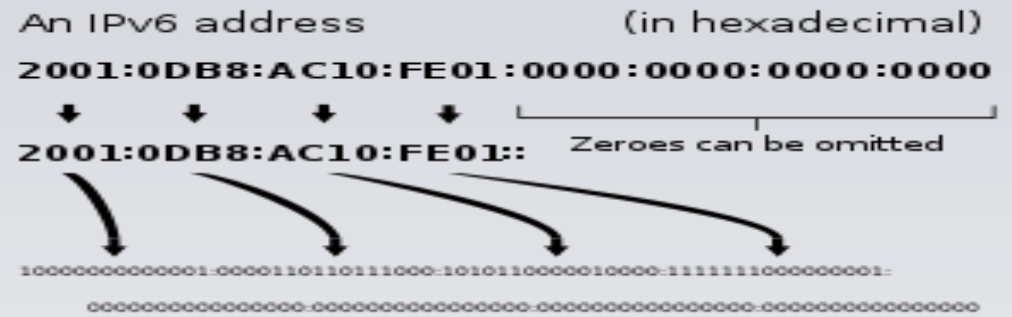
IP versions

- IP version 4 addresses

An IPv4 address (dotted-decimal notation)



- IP version 6 addresses





IP versions

- IPv4: 32-bit* number: Written in Dotted Decimal Notation

205.150.58.7

4 billion different host addresses

- IPv6: 128-bit* number: Written in Hex Decimal Notation

2001:0503:0C27:0000:0000:0000:0000:0000

16 billion billion network addresses



Types of IP address

- Static address
- Dynamic address



Types of IP address

- Static IP address
 - manually input by network administrator
 - manageable for small networks
 - requires careful checks to avoid duplication



Types of IP address

- Dynamic IP address
- examples - BOOTP, DHCP
 - assigned by server when host boots
 - derived automatically from a range of addresses
 - duration of 'lease' negotiated, then address released back to server



How to determine an IP address.

- Microsoft Windows Users

- § Click Start / Run and type: **cmd** or **command** to open a Windows command line.

- § From the prompt, type **ipconfig** and press enter. This should give you information similar to what is shown below.

- Windows XP IP Configuration

- Ethernet adapter Local Area Connection:

- Connection-specific DNS Suffix . :

IP Address : 192.168.1.101

Subnet Mask : 255.255.255.0

Default Gateway : 192.168.1.1



How do I determine the IP address of another computer or website?

- We must either the computer name or domain name
- use the ping command
- Example:

```
c:\>ping google.com
```

```
Pinging google.com [209.85.231.104] with 32 bytes of data: Reply from  
209.85.231.104: bytes=32 time=29ms TTL=54 ....
```

```
Ping statistics for 204.228.150.3: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 28ms, Maximum = 29ms, Average = 28ms
```

in the above example the IP address 209.85.231.104 is the IP address of the google.com domain.



Troubleshoot Basic IP Problems

- Series of commands :

```
c:\>IPCONFIG /RELEASE
```

```
c:\>IPCONFIG /RENEW
```

```
c:\>IPCONFIG /ALL
```

- Communications Failure



References :

- www.howstuffworks.com
- www.ip-adress.com
- Ip.com
- Webopedia.com



Thanks For Your Time

