ICT4255-Data Communication and Networks

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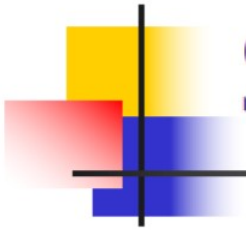
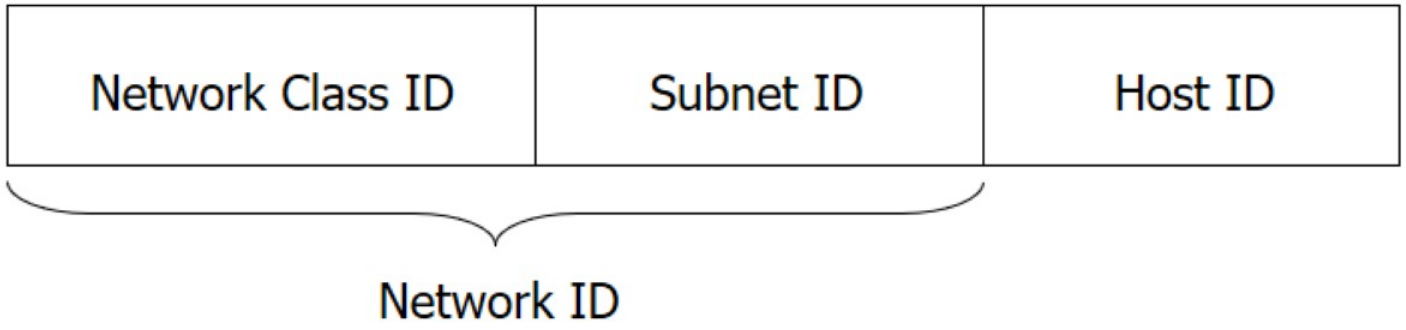


Subnetting

- Divide a network to smaller networks (subnets)
- Reasons
  - Reduce network traffic
  - Improve network performance
  - Management
- Allocate host bits for subnet bits
- Make use of subnet masks

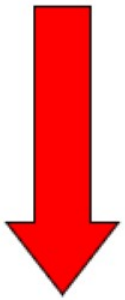
Subnet Mask

- A 32-bit string
- All 1s and then all 0s, they never mix
- It specifies number of bits for network ID in an IP address



Subnet Mask (Example I)

- IP address: 190.138.23.45
- Subnet Mask: 255.255.0.0



- Network ID: 190.138.0.0
- Host ID: 23.45

Subnet Mask (Example II)

- IP Address: 201.100.26.171
- Subnet Mask: 255.255.255.192

11111111.11111111.11111111.11000000

- First 26 bits as network ID, therefore
  - Network ID: 201.100.26.128
  - Host ID: 43

Subnet Mask (Example III)

- Design a subnet mask for a Class B network with 25 subnets
  - Number of bits for subnet = $\lceil \lg(25+2) \rceil = 5$
  - Number of bits for network ID = 16+5=21
  - Subnet mask is

11111111.11111111.11111000.00000000

255.255.248.0

Subnet Mask (Example IV)

- Given IP address 203.59.43.134 and subnet mask 255.255.255.192, find valid host range in this subnet
  - Network ID: 203.59.43.128
  - All 0 and all 1 host IDs are reserved, therefore
    - 203.59.43.129 – 203.59.43.190
  - Number of hosts 62
  - To verify: $62 = 2^6-2$