CSC411: Advanced Networks

Network Addresses

Note: **This class lecture will be recorded!**
If you do not consent to this recording, please do not ask questions via your video, audio or public chat; send your question to the instructor using the private chat.

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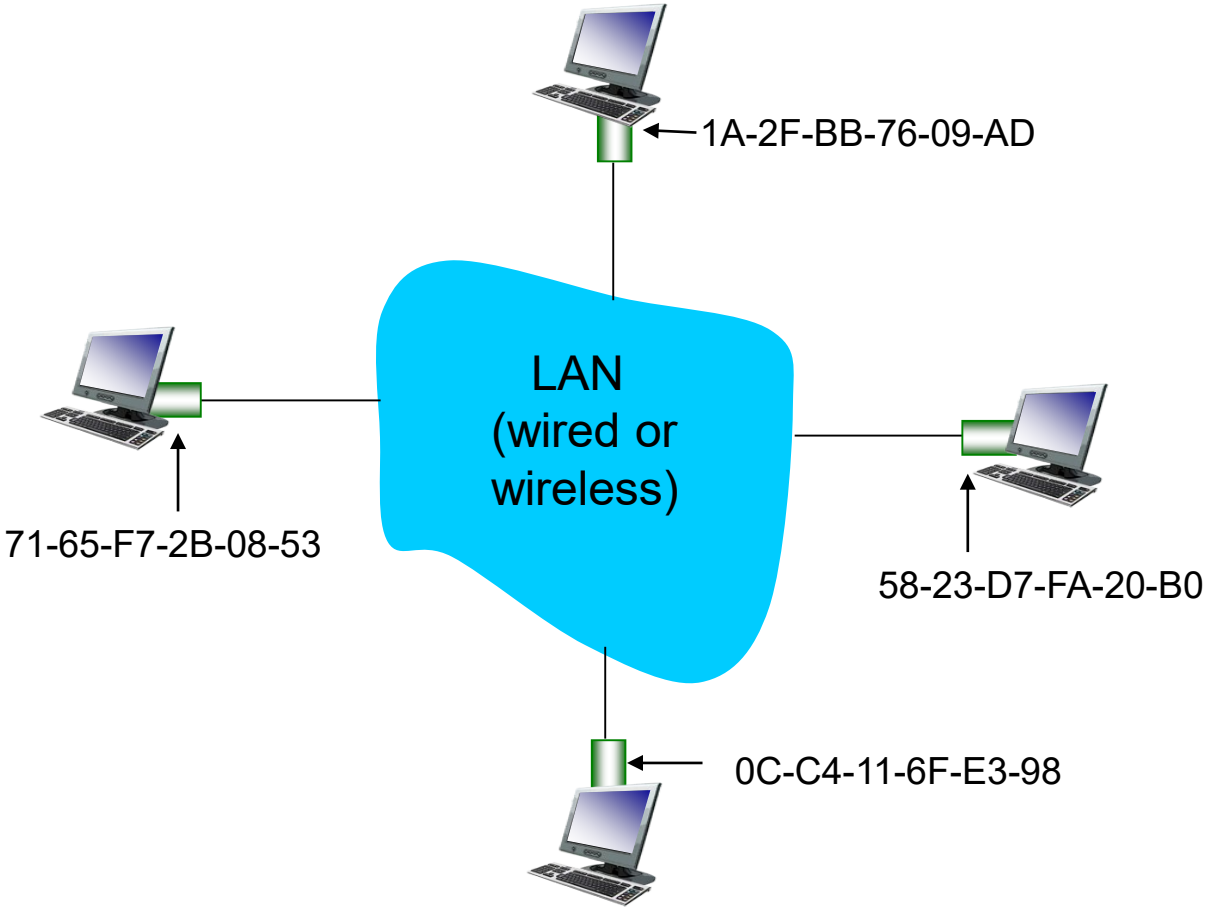
LAN Addresses



adapter

LAN Addresses

- Physical address
- Ethernet address
- MAC (Media Access Control) address

Receiver Pick Correct Frames

- Destination address
  - Link-layer header
- Destination address == my address → process frame
- No match → discard frame

- Link-layer broadcast address??

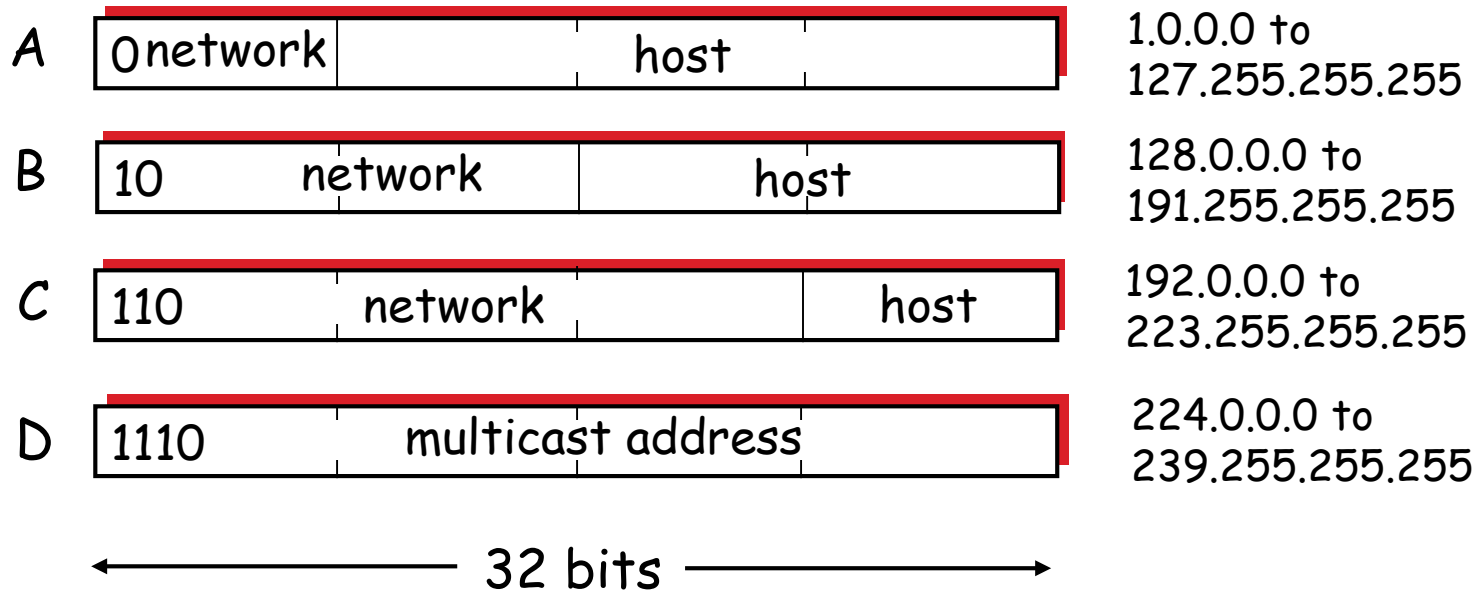
  FF-FF-FF-FF-FF-FF

IP Addresses

- 32-bits
- Dotted-decimal notation
- Prefix part → network
- Suffix part → host

- Special Addresses
  - 0 ← Network
  - 255 ← Broadcast
  - 127.0.0.1 ← loopback

Classes of IP Addresses

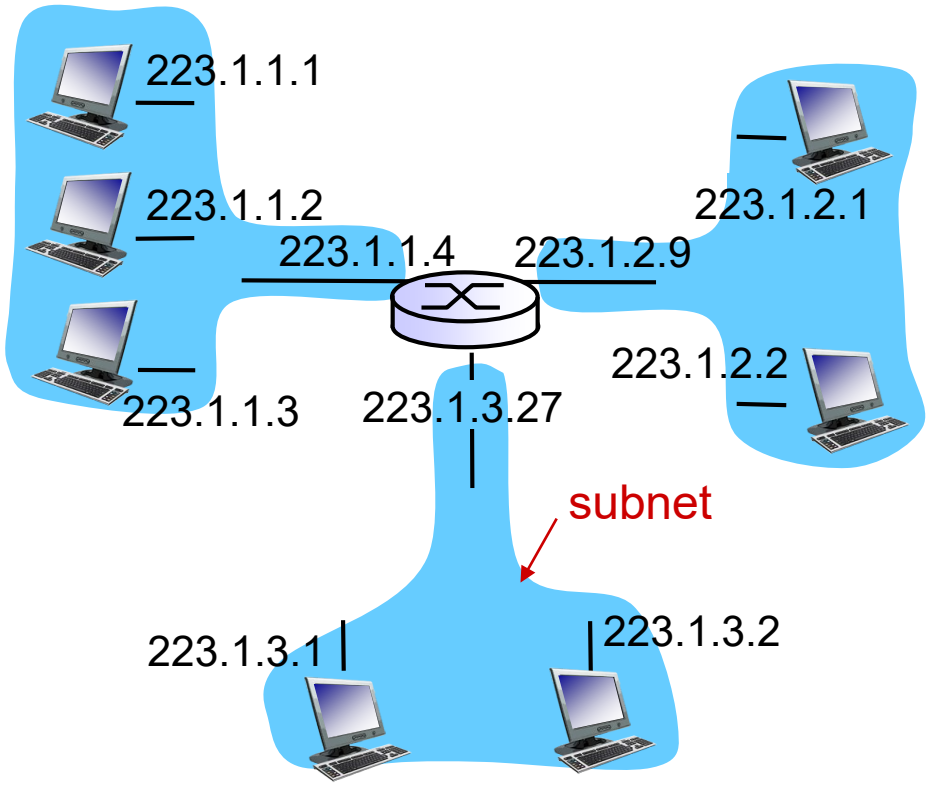


Classes – Networks/Hosts

Class	Available Networks	Available Hosts
A	126	16,777,214
B	16,382	65,534
C	2,097,150	254

Class	Class ID	IP Range	Default Mask
A	0	1 – 126	255.0.0.0
B	10	128 – 191	255.255.0.0
C	110	192 – 223	255.255.255.0
D	111	224 – 247	Multicast
E	11111	248 – 254	Reserved for future

Subnets



network consisting of 3 subnets

Subnets

- Divide host id (suffix)
  - Subnet id
  - Host id
- Bits borrowed from host id (suffix)
  - Number of subnets $= 2^n - 2$
    - n – number of bits borrowed from host id
  - Why (– 2)?

Subnet Mask

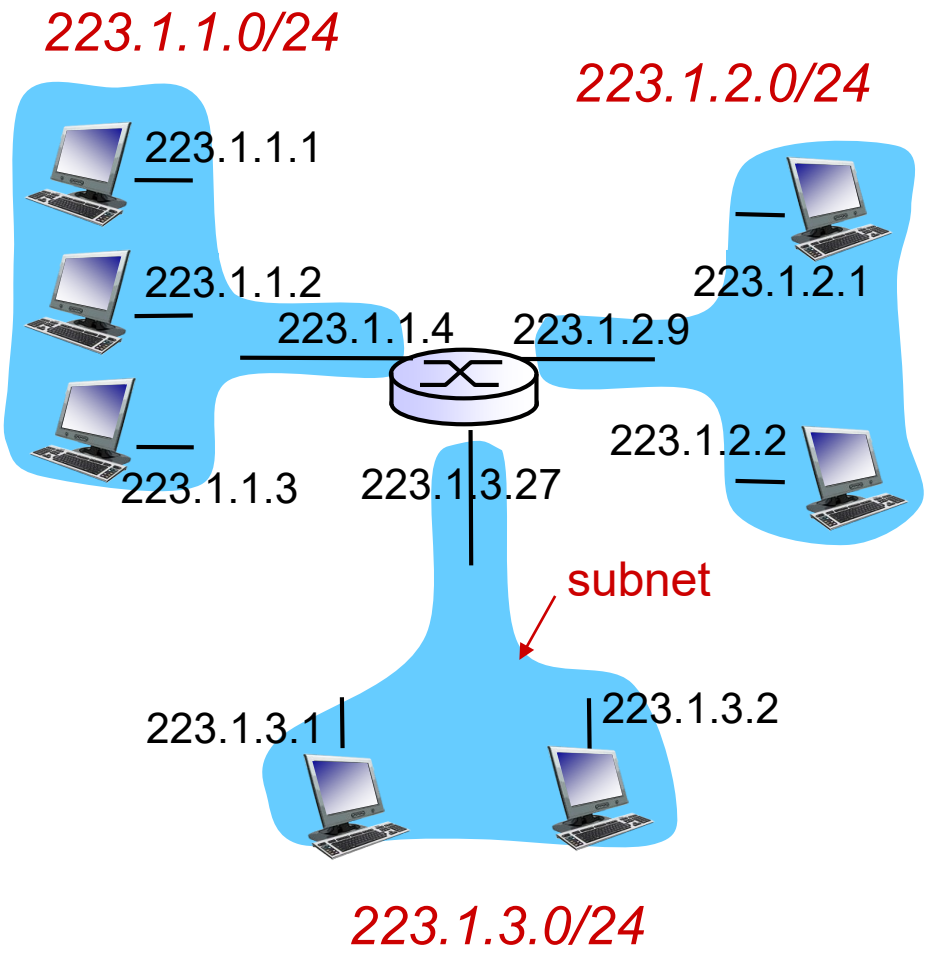
- Number of bits for subnet and host portion of IP address
  - 1 – network part
  - 0 – host part

Number of Mask Bits	Subnet Mask	Available SubNets	Available Hosts
2	255.255.255.192	2	62
3	255.255.255.224	6	30
4	255.255.255.240	14	14
5	255.255.255.248	30	6
6	255.255.255.252	62	2

Subnet Mask Example

- 32-bit network prefix
  - 128.10.0.0
- 32-bit mask
  - 255.255.0.0
- 32-bit destination address
  - 128.10.2.3
- Logical and between destination address and address mask?

Subnets



subnet mask: /24

DHCP

- Dynamic Host Configuration Protocol

- DHCP overview:
  - host broadcasts "DHCP discover" msg [optional]
  - DHCP server responds with "DHCP offer" msg [optional]
  - host requests IP address: "DHCP request" msg
  - DHCP server sends address: "DHCP ack" msg

DHCP Scenario