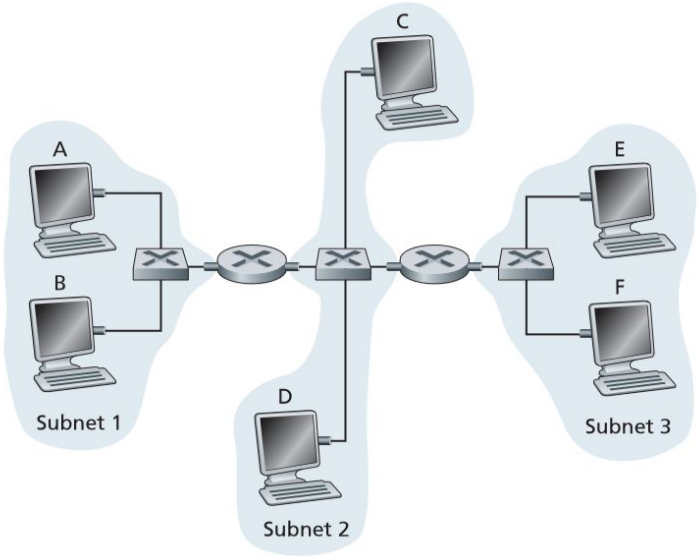
EECS 489 Discussion 10

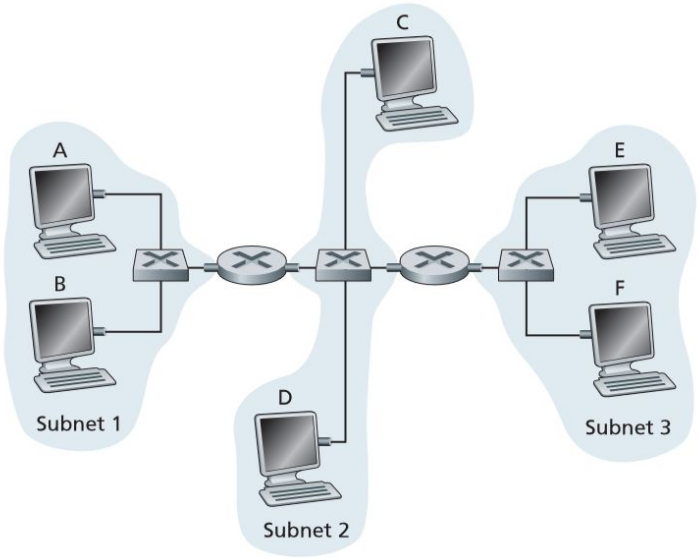
Q1



The router between subnet 1 and 2 is R1. The router between subnet 2 and 3 is R2.

- Consider sending an IP datagram from Host E to Host F. Will Host E always ask router R2 to help forward the datagram?
- Suppose E would like to send an IP datagram to B. Assume that E's ARP cache does not contain B's MAC address. Will E perform an ARP query to find B's MAC address? Why? In the Ethernet frame (containing the IP datagram destined to B) that is delivered to router R1, what are the source and destination IP and MAC addresses?

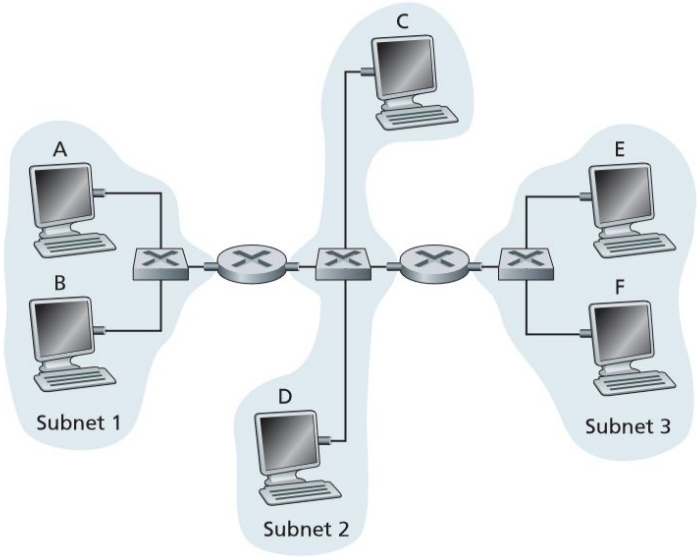
Q1



The router between subnet 1 and 2 is R1. The router between subnet 2 and 3 is R2.

- Consider sending an IP datagram from Host E to Host F. Will Host E always ask router R2 to help forward the datagram? No
- Suppose E would like to send an IP datagram to B. Assume that E's ARP cache does not contain B's MAC address. Will E perform an ARP query to find B's MAC address? No Why? In the Ethernet frame (containing the IP datagram destined to B) that is delivered to router R1, what are the source and destination IP and MAC addresses?

Q1



The router between subnet 1 and 2 is now a switch S1. The router between subnet 2 and 3 is R2.

- Suppose Host A would like to send an IP datagram to Host B, and A's ARP cache does not contain B's MAC address. Further suppose that S1's forwarding table contains entries for Host B and router R2 only. Thus, A will broadcast an ARP request message. What actions will switch S1 perform once it receives the ARP request message? Will router R2 also receive this ARP request message? If so, will R2 forward the message to Subnet 3?

Q2 CSMA/CD

Suppose nodes A and B are on the same 10 Mbps broadcast channel, and the propagation delay between the two nodes is 225 bit times. Suppose A and B begin transmission at t = 0 bit times. When do they both detect collisions? Suppose $K_A = 0$ and $K_B = 1$. At what time does B schedule its retransmission? At what time does A begin transmission? At what time does A's signal reach B? Does B refrain from transmitting at its scheduled time?

Q2 CSMA/CD

- At t = 0: A and B start sending data
- At t = 225: Collision detected
- At t = 225 + 48 = 273: Jamming signal is done being sent (jamming signal size is 48 bits)
- At t = 273: A starts transmitting
- At t = 273 + 512 = 785: B must start checking for idle channel
- At t = 273 + 225 = 498: A’s transmission reaches B

Q3 CSMA/CD Minimum Frame Size

What is the minimum frame size for the link between nodes A and B given the following information:

- There are 5 10 Mbps Ethernet segments connecting the two nodes, each 500m long
- Propagation speed is 2*10^8 m/s.

Q3 CSMA/CD Minimum Frame Size

Round-trip propagation delay on 2.5 km is 25 microseconds.

25 microseconds * 10 Mpbs = 31.25 bytes

So minimum frame size is 32 bytes