EECS 489 - WN 23

Discussion 11

Announcements

Assignment 4 is out.

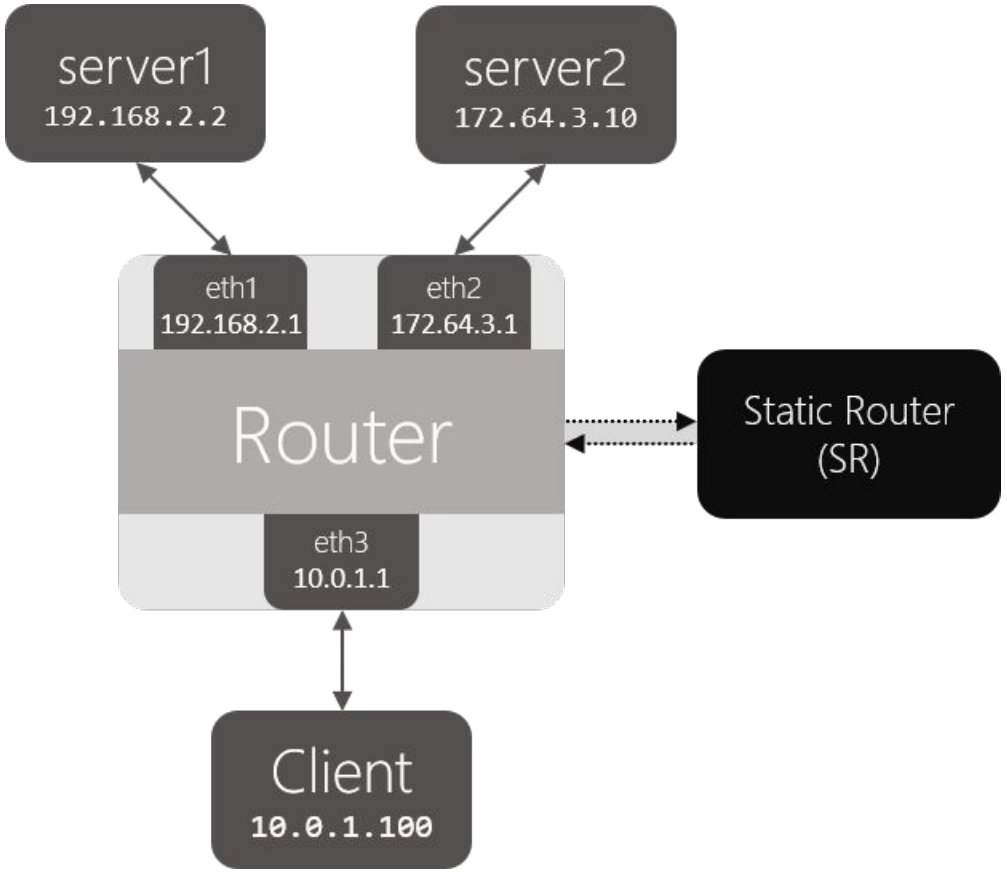
Due date: **04/21 2023, 11:59 PM**

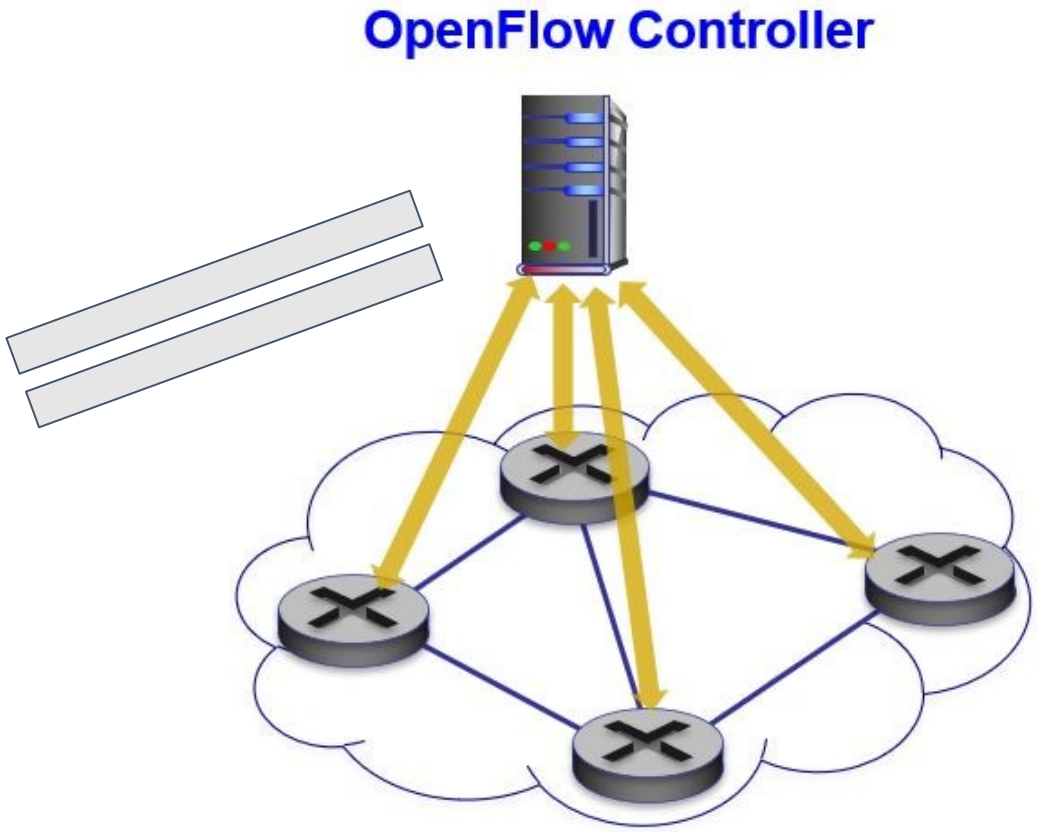
Lateday policy:

You have 3 group latedays in total for assignment 2 - 4.

Please compile your code in the VM and test it carefully.

Assignment 4 & SDN





Data Link Layer

- Protocols
  - Ethernet (IEEE 802.3)
    - CSMA(Carrier-sense multiple access)/CD
      - after collision is detected
  - Wi-Fi (IEEE 802.11)
    - CSMA/CA
      - avoid collision
  - etc.
- Devices working in this layer use MAC addresses

Address Resolution Protocol

- Used to find the MAC address of another device
  - IP address to MAC address
  - ARP requests need to be broadcast
    - ff:ff:ff:ff:ff:ff is the broadcast address

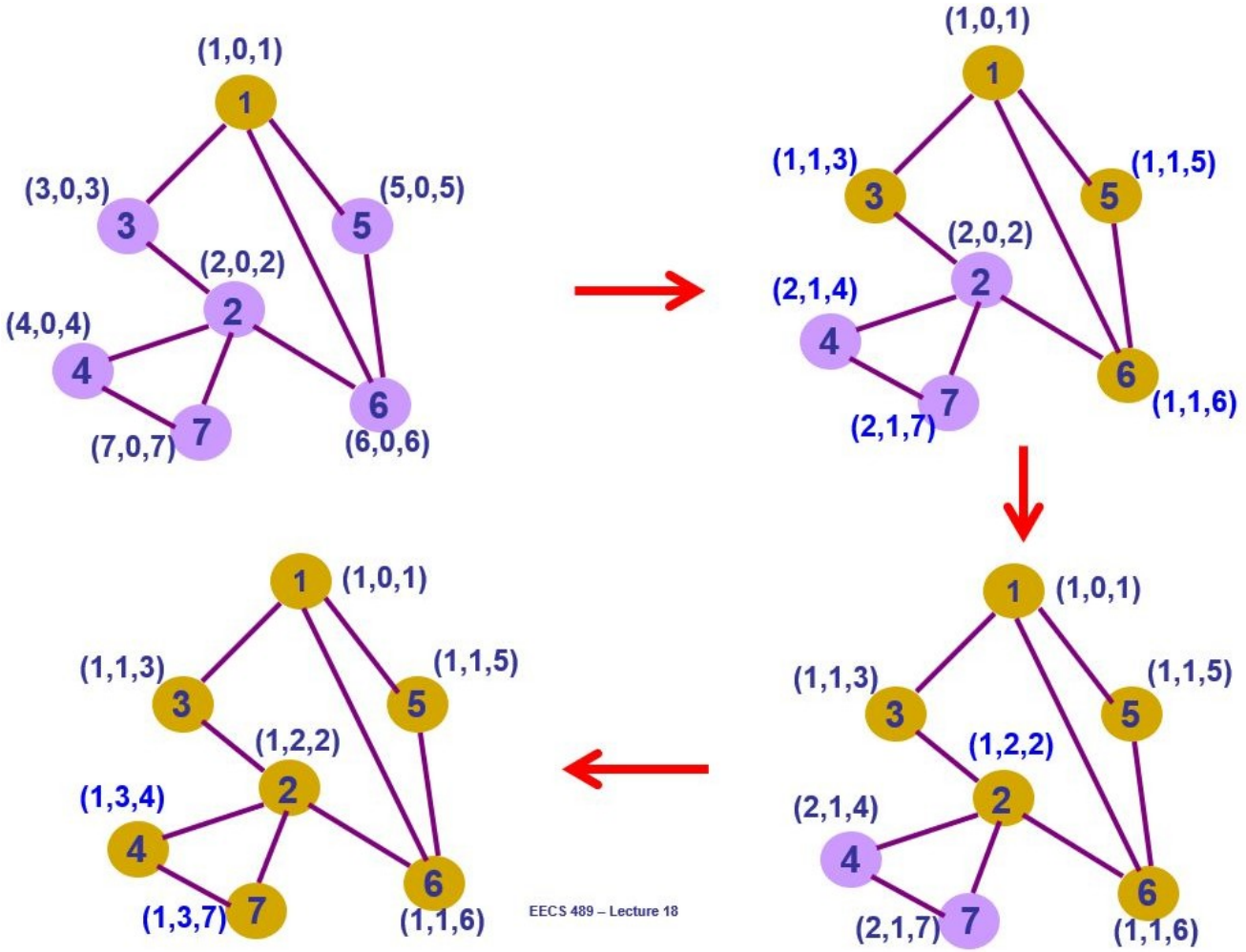
Octet offset	0	1
0	Hardware type (HTYPE)	
2	Protocol type (PTYPE)	
4	Hardware address length (HLEN)	Protocol address length (PLEN)
6	Operation (OPER)	
8	Sender hardware address (SHA) (first 2 bytes)	
10	(next 2 bytes)	
12	(last 2 bytes)	
14	Sender protocol address (SPA) (first 2 bytes)	
16	(last 2 bytes)	
18	Target hardware address (THA) (first 2 bytes)	
20	(next 2 bytes)	
22	(last 2 bytes)	
24	Target protocol address (TPA) (first 2 bytes)	
26	(last 2 bytes)	

Spanning Tree Algorithm

- Used to avoid broadcast storm
- Steps:
  - Initially, each switch proposes itself as the root
  - Switch X announces (X, 0, X) to its neighbors
  - Switches update their view of the root
  - Upon receiving (Y, d, Z) from Z, check Y's id
  - If Y's id < current root: set root = Y
  - Switches compute their distance from the root
  - Add 1 to the shortest distance received from a neighbor

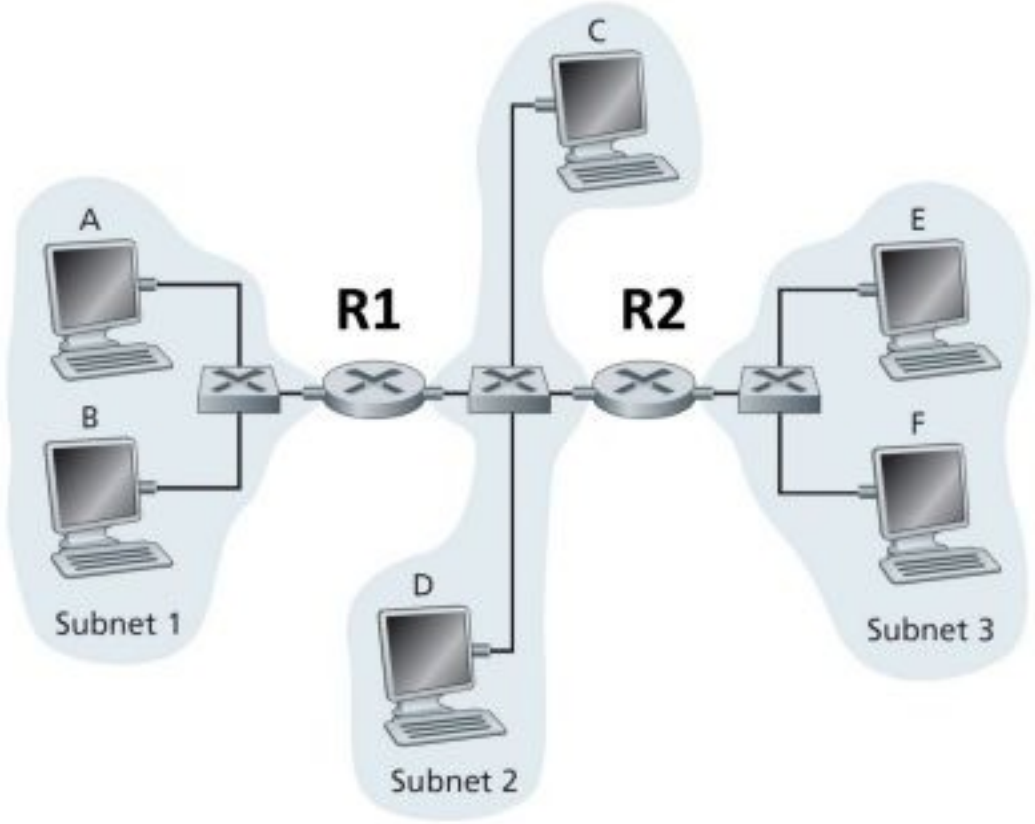
    If root or shortest distance to it changed, send neighbors updated message (Y, d+1, X)

Spanning Tree Algorithm



Q1 Forwarding

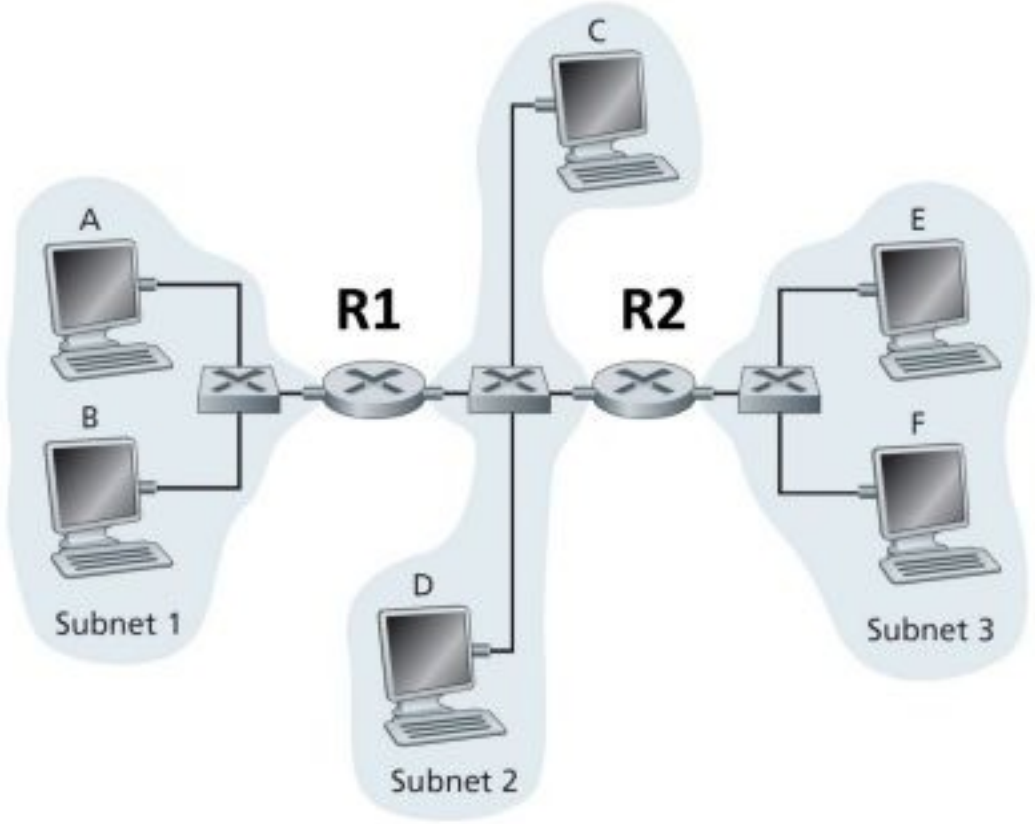
Consider sending an IP packet from Host E to Host F. Will Host E ask router R2 to forward the packet? Why?



Q1 Forwarding

Consider sending an IP packet from Host E to Host F. Will Host E ask router R2 to forward the packet? Why?

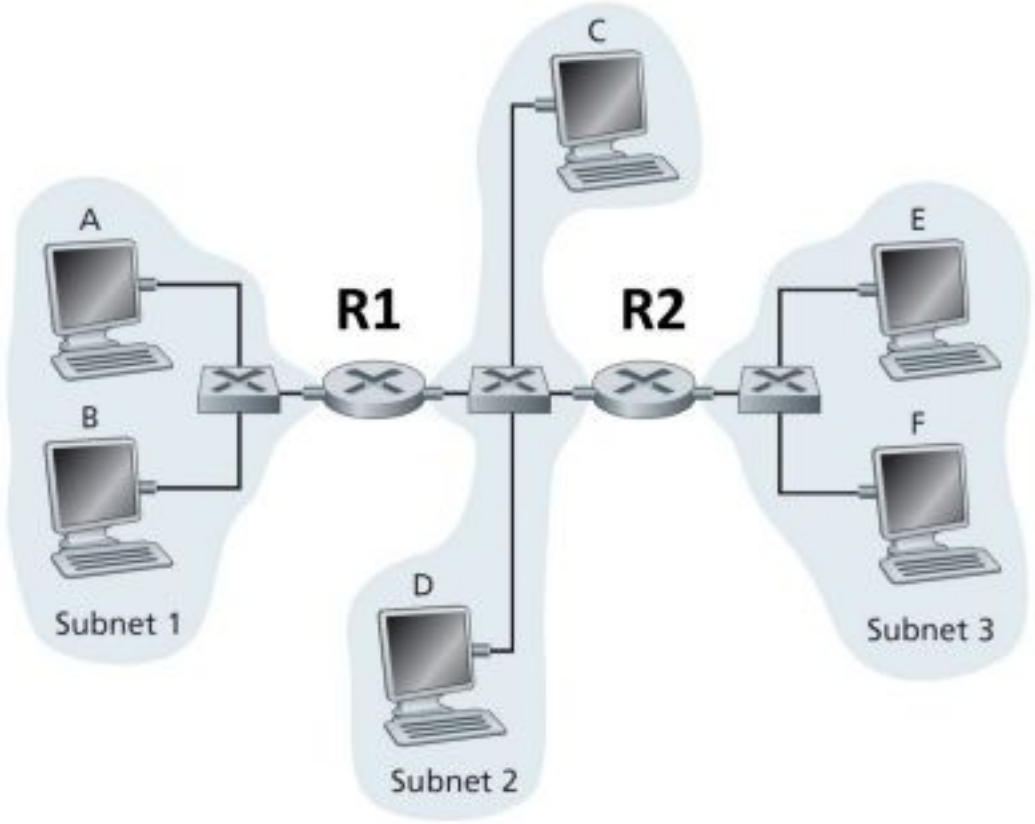
No. Host E and Host F are on the same subnet and are connected via switch.



Q2 ARP

Consider E sending an IP packet to B. Assume E's ARP cache is empty. Will E make an ARP request to find B's MAC address?

Will E make an ARP request to? If yes, to whom?



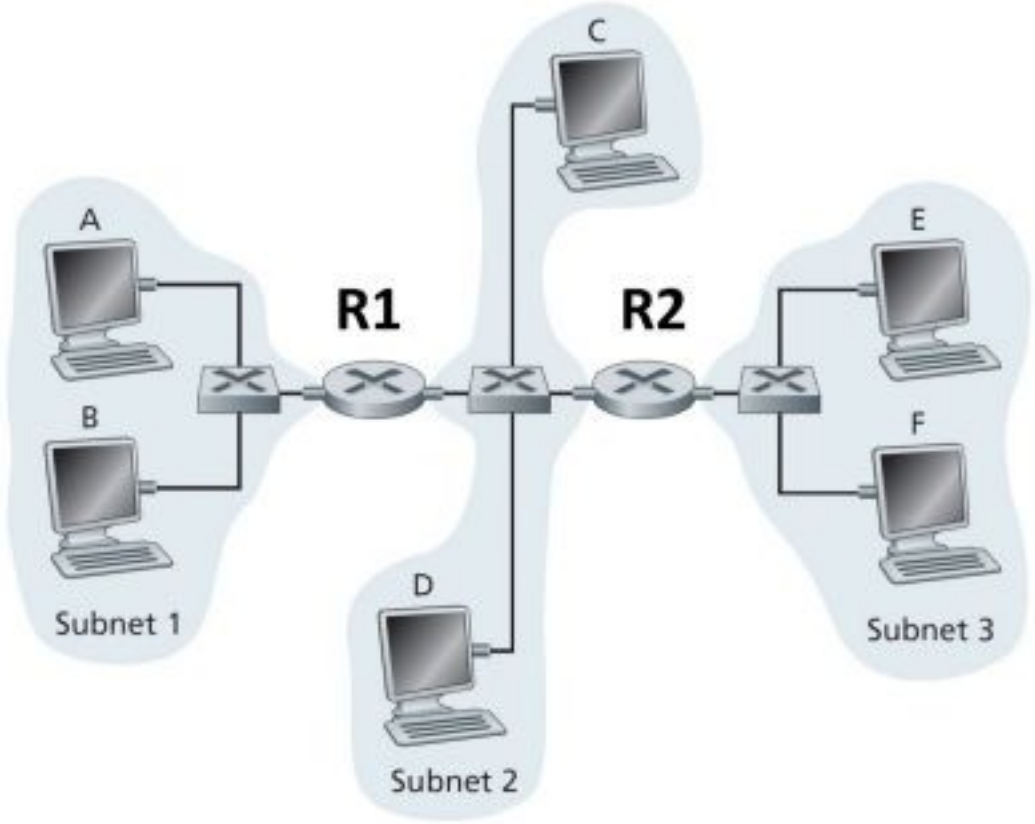
Q2 ARP

Consider E sending an IP packet to B. Assume E's ARP cache is empty. Will E make an ARP request to find B's MAC address?

No. Host B and Host E are on the different subnets.

Will E make an ARP request to? If yes, to whom?

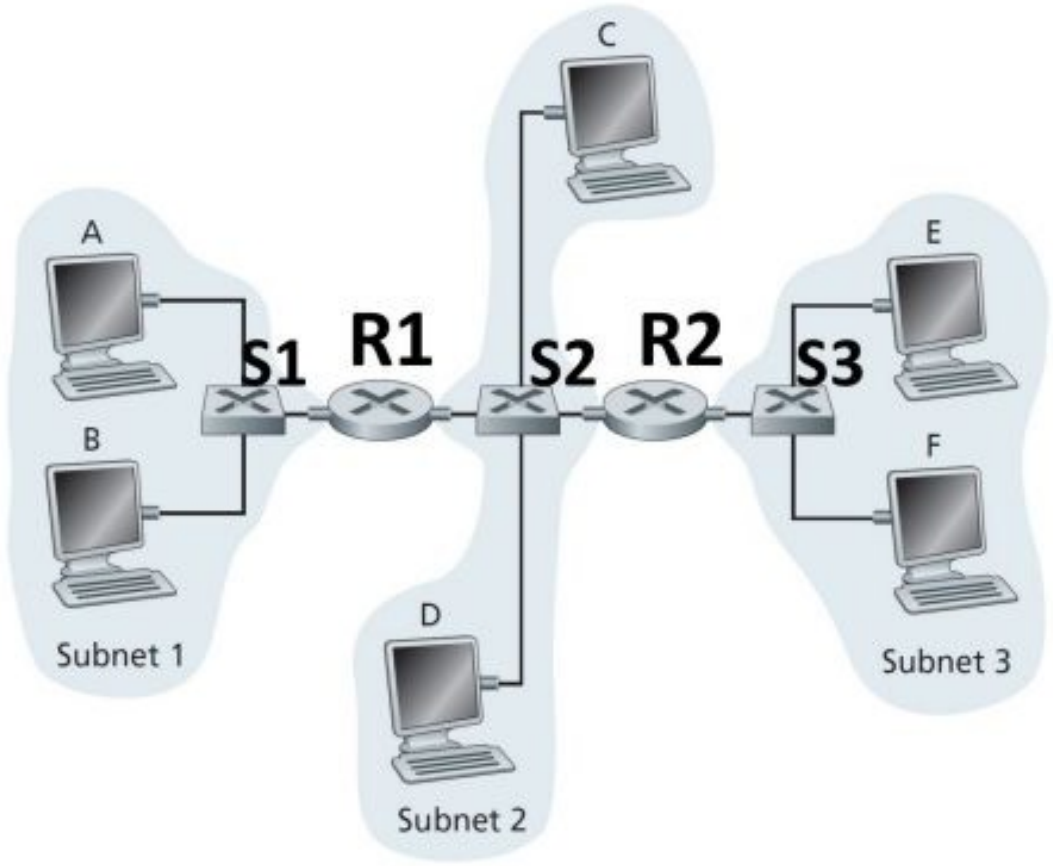
R2 (next hop to B)



Q3 ARP and IP

Consider E sending an IP packet to B.

In the Ethernet frame of the IP packet going to B that is delivered to **router R1**, what are the source and destination IP and MAC addresses?



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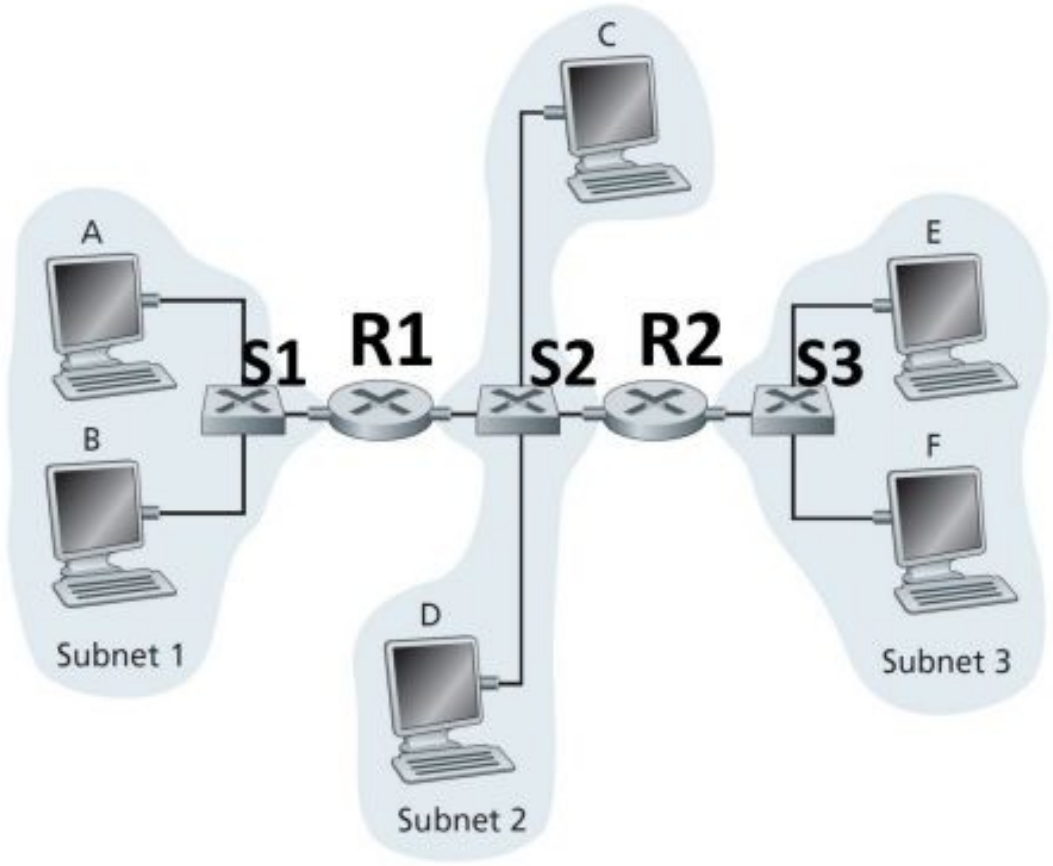

srcIP: IP-E, dstIP: IP-B
srcMAC: MAC-R2, dstMAC: MAC-R1

Thanks

Have a good one!