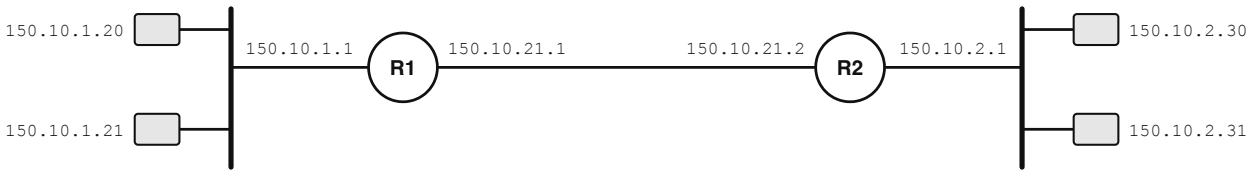
Q1 **IP Addressing and DHCP** Ch. 4 slides 47–49, 52–54

Names: _____

Two routers connect two LANs. Each label is the IP address of one interface, and every subnet uses a **/24** mask.



1. List the address of every subnet in this network, in a.b.c.d/24 form.

A laptop joins R2's LAN. The DHCP server runs in router R2, at **150.10.2.1** (slide 53). Clients use UDP port **68** and servers use port **67**. The server offers the laptop **150.10.2.57**.

2. Fill in the rest of the exchange. The discover row is done for you.

Message	Source IP : port	Destination IP : port	yiaddr ("your address")
discover	0.0.0.0 : 68	255.255.255.255 : 67	0.0.0.0
offer			
request			
ACK			

3. The laptop sends the request from 0.0.0.0, even though it has been offered 150.10.2.57. Why?

4. The server knows which address it is giving the laptop. Why does it send the offer and ACK to 255.255.255.255 instead of to 150.10.2.57?

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Q2 **CIDR and Hierarchical Addressing** Ch. 4 slides 50, 58–61

Fly-By-Night-ISP holds **200.23.16.0/20**. It gives Organization 1 the block **200.23.18.0/23**.

1. How many addresses are in Organization 1's block? What are its first and last addresses?

Addresses: _____ First: _____ Last: _____

Organization 1 now moves to ISPs-R-Us, which holds **199.31.0.0/16**. Organization 1 keeps its addresses.

2. What does each ISP now advertise to the rest of the Internet?

Fly-By-Night-ISP: _____

ISPs-R-Us: _____

3. A core router installs both ISPs' advertisements. To which ISP does it forward a datagram for **200.23.19.5**? For **200.23.20.5**? Why?

200.23.19.5 → _____ 200.23.20.5 → _____

Discussion

TCP opens a connection with three messages (SYN, SYNACK, ACK), but DHCP uses four. What problems could arise if DHCP reduced to 2 messages by having the server commit an address to a client during the Offer step, without any acknowledgement? What benefits come from having all 4 messages in DHCP and is the cost of extra messages significant?

Hint: what if the LAN has two DHCP servers? What if the Offer is lost?