CMPE 150/L – Winter ‘19

Sample questions Ch4 (Network Layer) questions

1. What is the difference between routing and forwarding?

2. In a Virtual circuit (VC) network, Alice wants to send data to Bob.

   i. What needs to happen before Alice can start sending data to Bob? Explain.

   ii. How long does it take before the first piece of data can be transmitted from Alice to Bob? Explain.

   iii. If Alice and Bob were connected through a datagram network, how long does it take before Alice can transmit the first piece of data to Bob? Explain.

3. A NAT device typically sits at the ``entrance/exit'' of an organization's network. Describe what the NAT device does, including information it needs to maintain, when:

   i. A host within the organization's network sends traffic to another host within the network.

   ii. A host within the organization's network sends traffic to a host on the Internet.

   iii. How do you think NAT addresses the problem of IP address depletion?

   iv. Explain how NAT handles incoming traffic in response to traffic originating within the organization's network.

   v. What is the NAT traversal problem?

4. Consider the network topology shown the lecture slides titled “IP Addressing: introduction”. Assume in that configuration the subnet mask is /24.

   i. How many different subnets can be used?

   ii. How many different hosts can be connected to each subnet?

   iii. If a new host wants to connect to subnet 223.1.2.0/24, what range of IP addresses can be assigned to the host?

iv. Suppose each subnet needs to accommodate 1,000 different hosts. How can this be accomplished?

5. A router has the following (CIDR) entries in its routing table:

Address/mask	Next hop
135.46.56.0/22	Interface 0
135.46.60.0/22	Interface 1
192.53.40.0	Interface 2
default	Interface 3

For each of the following IP addresses, how does the router forward a packet it receives with that address?

(a) 135.46.63.10
(b) 135.46.57.14
(c) 135.46.52.2
(d) 192.53.40.7
(e) 192.53.56.7