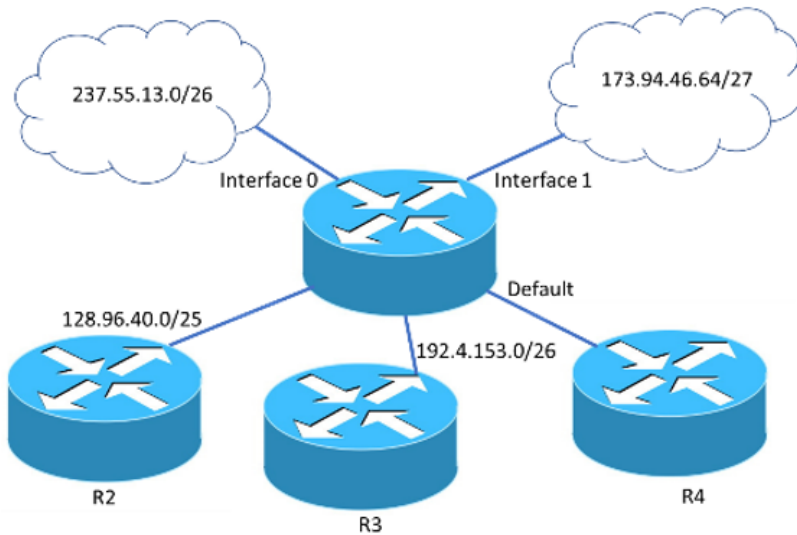


EECS 563
Homework #8

1. What is NAT and why is it used? Is NAT used in IPv6?

2. IPv6 Addresses
 - a. What is the main reason for the transition from IPv4 to IPv6? Why is this transition taking so long to implement?
 - b. What is an IPv4-mapped IPv6 address for a host with an IPv4 address of 129.1.1.63
 - c. What is the compact IPv6 address for 48CD:0000:0000:0000:0000:0000:0000:A446
 - d. How does IPv6 not having header checksum improve router performance?

3. A router is directly connected to two networks via Interface 0 and Interface 1, i.e., it can directly deliver packets over these interfaces. This router can also forward packets to routers, R2, R3, and R4. The forwarding table for this router is given below.



The forwarding table for this router is given below.

<u>SubnetNumber</u>	<u>SubnetMask</u>	<u>NextHop</u>
237.55.13.0	255.255.255.192	Interface 0
173.94.46.64	255.255.255.224	Interface 1
128.96.40.0	255.255.255.128	R2
192.4.153.0	255.255.255.192	R3
Default		R4

- a) Provide each subnet number in the above forwarding table in \n (CIDR) notation.

Describe what the router does with an IP input packet with the following destination address:

- b) 173.94.46.66
- c) 173.94.46.97

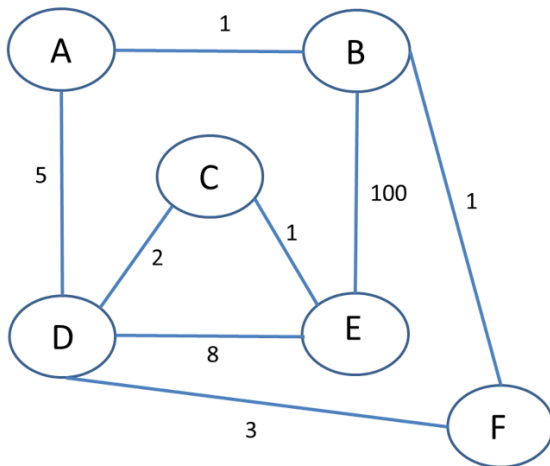
- d) 10.2.2.0
- e) 237.55.12.213
- f) 192.4.153.17
- g) 180.55.113.114

4. AS

- a. What is an AS?
- b. Why are AS's needed in the Internet?
- c. Why are different routing protocols for intra-AS and inter-AS networks?
- d. BGP is an IGP. TRUE or FALSE
- e. OSPF is an IGP. TRUE or FALSE

5. In the network shown below assume node A knows the “distance” to every other link, i.e., the numbers on each link (arc) are the distances.

- a. What can the “distance” represent in the above network?
- b. How does Node A learn the topology and the “distances”?
- c. Use Exhaustive Search to find the minimum cost route from Node A to all other nodes.
- d. Repeat c. if the distance/cost metric is the number of hops.



6. What is the difference between forwarding and routing?