

Homework 4

1)

a)

Destination	Next Hop
0.0.0.0/1	3
224.0.0.0/10	0
224.64.0.0/16	1
224.64.0.0/10	2
224.128.0.0/1	3

- b) For the following destination addresses the forwarding table uses longest prefix matching to determine the appropriate link interface for the datagrams. Longest prefix matching means each individual address searches for the IP range that contains the highest degree of the same address. In this case, since entry number two can be matched to either 1 or 2, it checks to see which range of IP's has the closest match, which would be 2 since it is a smaller range.

Destination Address	Link Interface
11001000 10010001 01010001 01010101 (200.145.81.85)	3
11100001 01000000 11000011 00111100 (225.64.195.60)	1
11100001 10000000 00010001 01110111 (225.128.17.119)	3

2)

a) Given: 23.40.0.0/21

Network Address: 23.40.0.0

Subnet Mask: 255.255.248.0

Broadcast Address: 23.40.7.255

Useable Range: 23.40.0.1 - 23.40.7.254

Total Users: 2046

b) Based on the given forwarding table, the next hop that the router should use for a packet destined for 213.40.0.1 would be 1.2.3.5

c) Given: 146.143.1.55/26

Network Address: 146.143.1.55

Subnet Mask: 255.255.255.192

Broadcast Address: 146.143.1.119

Useable Range: 146.143.1.56 - 146.143.1.118

Total Users: 62

d) Given Network: 230.8.16.0

Given Broadcast: 230.8.23.255

CIDR: /21

To find the CIDR of the given subnetwork, first I determined how many IP addresses are available in the given subnetwork. Since there are 2040 total addresses (256×8), create a subnet mask that allows that many addresses. In our case, the subnet mask would be 255.255.248.0 which corresponds to a CIDR of /21.

3)

a) One IP address that can be assigned to the given subnet of 128.119.40.128/27 is the IP address 128.119.40.129. The range of usable addresses is from 128.119.40.129 to 128.119.40.158.

b) Given Network: 121.19.30.128/25 Create 4 equal subnet blocks

Subnet 1: 121.19.30.128/27

Subnet 2: 121.19.30.160/27

Subnet 3: 121.19.30.192/27

Subnet 4: 121.19.30.224/27

4)

Table 1:

Source IP: 168.27.3.4
 Dest IP: 212.34.2.3
 Source Port: 12345
 Dest Port: 80

Table 2:

Source IP: 192.168.5.5
 Dest IP: 212.34.2.3
 Source Port: 7777 (or X)
 Dest Port: 80

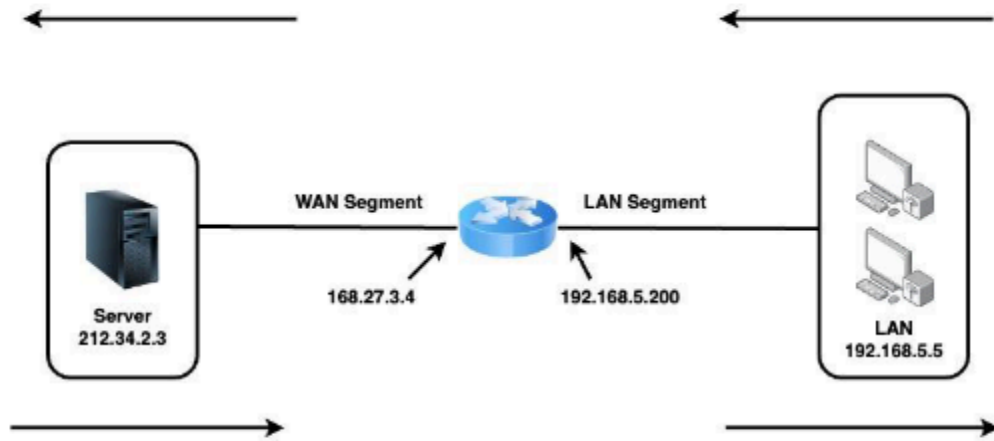


Table 3:

Source IP: 212.34.2.3
 Dest IP: 168.27.3.4
 Source Port: 80
 Dest Port: 12345

Table 4:

Source IP: 168.27.3.4
 Dest IP: 192.168.5.5
 Source Port: 12345
 Dest Port: 7777 (or X)

5)

Message 1 (DISCOVER)

Source IP, Port: 0.0.0.0, 68
 Dest IP, Port: 255.255.255.255, 67
 yiaddr: 0.0.0.0
 Trans ID: 777

Message 2 (OFFER)

Source IP, Port: 223.1.2.5, 67
 Dest IP, Port: 255.255.255.255, 68
 yiaddr: 223.1.2.11
 Trans ID: 777

Message 3 (REQUEST)

Source IP, Port: 0.0.0.0, 68
 Dest IP, Port: 255.255.255.255, 67
 yiaddr: 223.1.2.11
 Trans ID: 778

Message 4 (ACK)

Source IP, Port: 223.1.2.5, 67
 Dest IP, Port: 255.255.255.255, 68
 yiaddr: 223.1.2.11
 Trans ID: 778

6) Flow Table for S2

Match	Action
IP Source = 10.2.0.3 IP Dest = 10.3.0.*	forward(2)
IP Source = 10.2.0.3 IP Dest = 10.1.0.*	forward(2)
IP Source = 10.2.0.4 IP Dest = 10.3.0.*	forward(1)
IP Source = 10.2.0.4 IP Dest = 10.1.0.*	forward(1)