Branch: master ▾ Find file Copy path

cs-118 / Homework7.md

prithvikannan added 7.3
ea9cbb4 16 hours ago

1 contributor

Raw Blame History

69 lines (47 sloc) 2.57 KB

CS118 Homework 7

Prithvi Kannan UID: 405110096

Problem 1

a. NAT table

ip port inside	ip port outside
10.0.0.5:5000	128.97.27.37:8000
10.0.0.6:5000	128.97.27.37:8001
10.0.0.10:6000	128.97.27.37:8002
10.0.0.101:6001	128.97.27.37:8003
10.0.0.7:7000	128.97.27.37:8004
204.79.197.200:80	128.97.27.37:8005

b.

Message Received from Host: `MSG <10.0.0.6:5000, 172.217.11.78:80>`
Message Sent from Router: `MSG <128.97.27.37:8001, 172.217.11.78:80>`

Message Received from Host: `MSG <10.0.0.10:6000, 172.217.11.78:80>`
Message Sent from Router: `MSG <128.97.27.37:8002, 172.217.11.78:80>`

Problem 2

a. The 8 bit protocol field in IP datagram has the information so the network knows to pass the segment via TCP or UDP.

b. If you have n network interface cards on your computer, then you can have n IP addresses. Also, if using a virtual machine (such as VirtualBox or VMWare) you have a virtual adapter which is the equivalent of a NIC, so you can have n IP addresses for each VM running.

c. Skype uses UDP hole punching to circumvent the challenges of hosts behind two NAT firewalls. The NAT forwards packets when it is convinced that the packet is *outgoing*. Skype uses UDP so the firewall only sees the addresses and ports of source and desination, and if an incoming UDP packet matches a NAT table entry, it will pass it on. This allows clients to set up p2p UDP conneciton behind NATs.

d. NAT will probably not be needed for it's current purpose if IPv6 is globally deployed. NAT allows connections to appear to use less public IP addresses by adding a layer of indirection, which is important since IPv4 supports only 2^32 ≈ 4.7 billion addresses. On the contrary, IPv6 supports 2^128 addresses, so NAT will probably not be needed.

However, NAT does offer some security benefits that should at least be discussed, such as not giving out unnecessary information about network topology.

Problem 3

Step	N'	D(t),p(t)	D(u),p(u)	D(v),p(v)	D(w),p(w)	D(x),p(x)	D(y),p(y)
0	z	∞	∞	∞	∞	8,z	12,z
1	zx	∞	∞	11,x	14,x		12,z
2	zxv	15,v	14,v		14,x		12,z
3	zxvy	15,v	14,v		14,x		
4	zxvyu	15,v			14,x		
5	zxvyuw	15,v					
6	zxvyuwt						

Problem 4

a. eBGP
b. iBGP
c. eBGP
d. iBGP

Problem 5

c1 -> c2:

$$H \to I \to exchange \to F \to D \to C \to B$$
$$= 5 + 5 + 5 + 10 + 35 + 20 + 5 = 85 \text{ ms}$$

c2 -> c1:

$$B \to C \to A \to G \to H \to J$$
$$= 5 + 10 + 5 + 10 + 5 \text{ ms}$$

These routes are not symmetric