(Bonus/Make up missing marks) Wireshark NAT lab quiz [Limited to 3 Attempts]

Due 16 Jun at 17:00 **Points** 14 **Questions** 8
Available until 16 Jun at 17:00 **Time limit** None **Allowed attempts** 3

This quiz was locked 16 Jun at 17:00.

Attempt history

	Attempt	Time	Score
LATEST	Attempt 1	4,242 minutes	14 out of 14

ⓘ Correct answers are no longer available.

Score for this attempt: **14** out of 14
Submitted 13 May at 21:47
This attempt took 4,242 minutes.

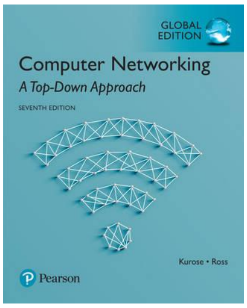
Question 1

1 / 1 pts

Wireshark Lab: NAT v7.0

Adapted from Supplement to *Computer Networking: A Top-Down Approach, 7th ed.,* J.F. Kurose and K.W. Ross

"Tell me and I forget. Show me and I remember. Involve me and I understand." Chinese proverb



In this lab, we'll investigate the behavior of the NAT protocol. This lab will be different from our other Wireshark labs, where we've captured a trace file at a single Wireshark measurement point. Because we're interested in capturing packets at both the input and output sides of the NAT device, we'll need to capture packets at *two* locations. Also, because many students don't have easy access to a NAT device or to two computers on which to take Wireshark measurements, this isn't a lab that is easily done "live" by a student. Therefore in this lab, you will use Wireshark trace files that we've captured for you. Before beginning this lab, you'll probably want to review the material on NAT section 4.3.4 in the text[1]. The basic idea behind NAT is that you can re-use **private IP addresses** **(https://en.wikipedia.org/wiki/Private_network#Private_IPv4_address_spac** behind the NAT router and these addresses will never be sent out onto the network, but are instead 'translated' by the NAT router to use a public IP address. Several private addresses can be mapped to a single public address and are differentiated by port number. The NAT router builds a table that allows the packets to be translated from their external to their internal addresses. NAT replaces private address/port with the public address/port as packets are sent onto the Internet and when responses are received, NAT looks up the address and port in the table and replaces the public address/port with the private address/port.

1. NAT Measurement Scenario

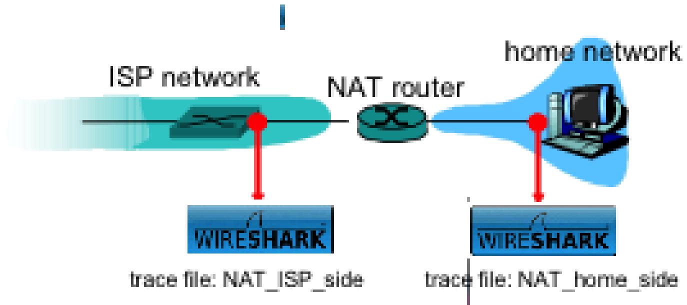


Figure 1: NAT trace collection scenario

In this lab, we'll capture packets from a simple web request from a client PC in a home network to a www.google.com server. Within the home network, the home network router provides a NAT service, as discussed in Chapter 4. Figure 1 shows our Wireshark trace-collection scenario. As in our other Wireshark labs, we collect a Wireshark trace on the client PC in our home network. This file is called NAT_home_side[2]. Because we are also interested in the packets being sent by the NAT router into the ISP, we'll collect a second trace file at a PC (not shown) tapping into the link from the home router into the ISP network, as shown in Figure 1. (The hub device shown on the ISP side of the router is used to tap into the link between the NAT router and the first hop router in the ISP). Client-to-server packets captured by

Wireshark at this point will have undergone NAT translation. The Wireshark trace file captured on the ISP side of the home router is called NAT_ISP_side.

Open the NAT_home_side file and answer the following questions. You might find it useful to use a Wireshark filter so that only frames containing HTTP messages are displayed from the trace file.

Looking at the NAT_Home_Side trace, what is the IP address of the client in the HTTP GET request?

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[1] References to figures and sections are for the 7th edition of our text, *Computer Networks, A Top-down Approach, 7th ed.,* J.F. Kurose and K.W. Ross, Addison-Wesley/Pearson, 2016.

[2] Download the zip file **http://gaia.cs.umass.edu/wireshark-labs/wireshark-traces.zip** **(http://gaia.cs.umass.edu/wireshark-**

192.168.1.100

Correct.

Question 2

1 / 1 pts

Is this address a public or private IP address?

○ public

● private

Question 3

4 / 4 pts

In the HTTP GET at time 7.109267. The source IP address of this request is 192.168.1.100 . The destination IP addresses is 64.233.169.104 . The TCP source port is 4335 and the destination port is 80

Answer 1:

192.168.1.100

Answer 2:

64.233.169.104

Answer 3:

4335

Answer 4:

80

Question 4

1 / 1 pts

At what time is the client-to-server TCP SYN segment sent that sets up the connection used by the GET sent at time 7.109267?

7.0757

Question 5

1 / 1 pts

The IP source and destination and ports in the SYN packet are the same as those in the HTTP GET?

● True

○ False

Question 6

1 / 1 pts

In the following we'll focus on the two HTTP messages (GET and 200 OK) and the TCP SYN and ACK segments identified above. Our goal below will be to locate these two HTTP messages and two TCP segments in the trace file (NAT_ISP_side) captured on the link between the router and the ISP. Because these captured frames will have already been forwarded through the NAT router, some of the IP address and port numbers will have been changed as a result of NAT translation.

Open the NAT_ISP_side*. Note that the time stamps in this file and in NAT_home_side are not synchronized since the packet captures at the two locations shown in Figure 1 were not started simultaneously.* (Indeed, you should discover that the timestamps of a packet captured at the ISP link is actually less that the timestamp of the packet captured at the client PC).

Comparing the NAT_Home_Side and the NAT_ISP_Side of the HTTP GET request, which of the fields are ***different***, after the packet has passed through the NAT router?

☑ checksum

☐ flags

☑ TTL (time to live)

☐ version

☑ source IP address

☐ source port number

☐ header length

☐ destination IP address

☐ destination port number

Question 7

1 / 1 pts

The source address in the HTTP GET request sent from the NAT router is (choose all that apply):

☐ a private (non routable) IP address

☑ a class A address

☑ a public (routable) IP address

☐ a class B address

☐ a class C or CIDR address

Question 8

4 / 4 pts

Using your answers to this lab, fill in the NAT translation table entries for HTTP connection studied in the lab.

NAT translation table

LAN side		**WAN side**	
IP: 192.168.1.100	:PORT: 4335	IP: 71.192.34.104	:PORT: 4335

Answer 1:

192.168.1.100

Answer 2:

4335

Answer 3:

71.192.34.104

Answer 4:

4335

Quiz score: **14** out of 14