Computer Networks Lab Assignment 1 Report

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Question 1

(a) The ping was successful for www.amazon.in. I transmitted 4 packets and received 4 packets successfully. There was 0 percent packet loss. Also the round trip time min is 15.001ms, avg is 16.579ms, max is 17.507ms and the std deviation is 0.949ms. The total time taken for the ping is 3012ms(latency).
The ping was unsuccesful when I tried for www.iitb.ac.in. I transmitted 4 packets and nothing was returned. There was 100% packet loss.
The ping was succesful for www.youtube.com. I transmitted 4 packets and received 4 packets successfully. There was 0 percent packet loss.
The ping was succesful for www.google.com. I transmitted 4 packets and received 4 packets successfully. There was 0 percent packet loss.

It was successful when everything was fine. Unsuccessful when there might be an improper TCP/IP setting or ARP information is not in router's cache or some other configuration issue.

(b) The main reason for any Round Trip Time is the number of hops it has to travel. If the number of hops it has to travel increases, then the round trip time also increases. So, when traffic will be less, number of hops will be less and time taken will also be less and vice versa. Some of the other reasons could be server response time and transmission medium used.

Question 2

(a) Using traceroute in windows os, We can see that it was taken 12 hops to go from source to destination. Network Map for www.amazon.in:
192.168.29.1 → 10.1.48.1 → 172.31.0.140 → 192.168.59.122 → 172.26.74.70 → 172.26.75.131 → 192.168.60.230 → 192.168.60.233 → 172.31.1.38 → 192.168.65.142 → 49.44.113.1 → 49.44.145.91(Destination).

Network Map for www.google.com:
192.168.29.1 → 10.1.48.1 → 172.31.0.140 → 192.168.59.126 → 172.26.74.70 → 172.26.75.131 → 192.168.60.232 → 192.168.60.231 → 172.31.2.67 → 72.14.217.252 → 108.170.253.97 → 216.239.43.239 → 216.58.196.164(Destination).

I used tracert command in windows and found these IP addresses. If I did it in ubuntu which was present in a virtual box, I was getting just 2 hops consisting only gateways using traceroute in ubuntu. I am attaching both of them in screenshots.

(b) The maximum hop number can be changed using the option -m . For example traceroute -m 5 www.google.com will take the maximum of 5 hops. I used traceroute -m 1 www.amazon.in to decrease max no. of hops to 1 from 2. Always there were only 2 hops observed in virtual box, so I had to set 1 as max no. of hops here.
Also, for trying this in windows, I used the command tracert -h 5 www.amazon.in to set maximum number of hops to 5 in windows operating system. I am also attaching a screenshot of that.

(c) The traceroute command sends three packets in each hop and each of the time stamp refers to the round trip time taken by the each packet to return.

(d) The time-to-live (TTL) is the number of hops that a packet is permitted to travel before being discarded by a router. It intentionally sends packets with low TTL values so that they will be discarded by each successive router in the destination path. The time between sending a packet and receiving the ICMP message that it was discarded is used to calculate the travel time for each successive hop. So, the main use is to calculate the travel time for each successive hop. Also, it limits the lifespan of data in the network.

Question3

(a) My machine's hostname is karthikubuntu. My IP Address is 10.0.2.15. I got this information using hostname and hostname -I commands or cat /etc/hostname command for hostname.

(b) Next hop router's IP address is 10.0.2.2 and MAC address is 52:54:00:12:35:02. I got this information using the command arp -a.

(c) Local DNS Server IP address is 127.0.0.53. I found it from the file /etc/resolv.conf and viewed it using cat in the terminal.

(d) Those numbers represent the protocol numbers associated with that specific protocols officially.

(e) Port numbers associated with following applications are:
ssh: 22, ftp: 21, nfs: 2049, smtp: 25. I got this information from the

file /etc/services.

I submitted network configuration files in the Q3 folder. I couldn't find the file /etc/network/interfaces in my virtual box containing ubuntu, So, I can't send that file. I have seen that file existed in slides, but the command really didn't work in my system. I am attaching a screenshot regarding that.