Assignment 1

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Question 1

Read the man pages of ifconfig, ping, traceroute, arp, dig, nslookup, and netstat and write their utilities in brief.

Answer 1

Ifconfig

- used to configure kernel-resident network interfaces.
- displays detailed information about the active interfaces.

Ping

- checks if the internet connection to the destination host is available or not.
- gives information about the round-trip delay in communicating with the host.
- tells us the percentage of packet loss.

Traceroute

- helps figure out the routing hops data has to go through, as well as response delays as it travels across nodes.
- enables you to locate where the data was unable to be sent along, known as points of failure.

Arp

- viewing and modifying the local Address Resolution Protocol (ARP) cache, which contains recently resolved MAC addresses of Internet Protocol (IP) hosts on the network.

Dig

- query information about various DNS records.

Nslookup

- use to diagnose Domain Name System (DNS) infrastructure.
- If the host is an Internet address and the query type is A or PTR, the nslookup command returns the name of the host.
- If the host is a name and does not have a trailing period, the search list is used to qualify the name.

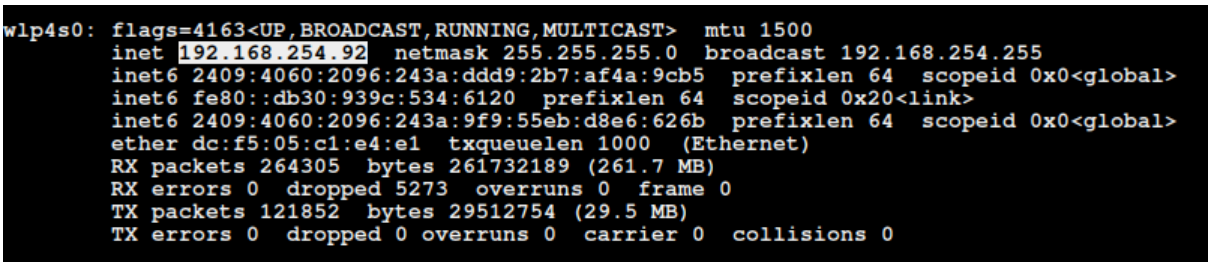
Netstat

- Displays active TCP connections, ports on which the computer is listening, Ethernet statistics, the IP routing table, IPv4 statistics (for the IP, ICMP, TCP, and UDP protocols), and IPv6 statistics (for the IPv6, ICMPv6, TCP over IPv6, and UDP over IPv6 protocols).

Question 2

Find the IP and hardware addresses of your machine using the ifconfig command.

Answer 2



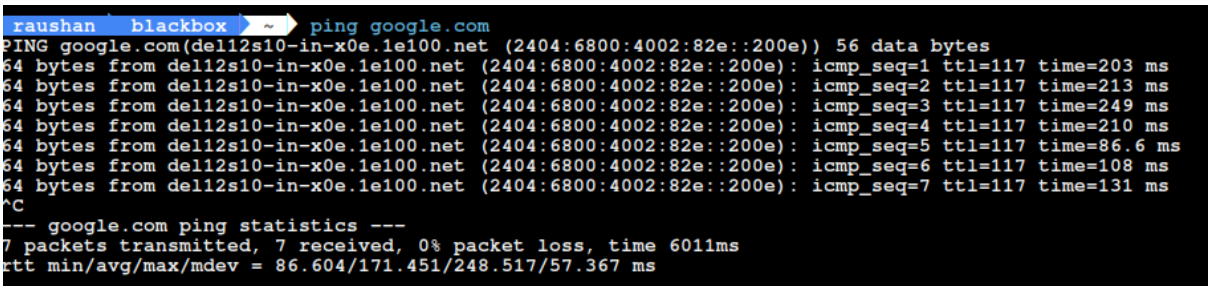
- IP address is: 192.168.254.92
- HW address is: dc:f5:05:c1:e4:e1

Question 3

Use ping command and find out

I. The average RTT (round trip time).
II. The %packet loss.
III. Size of the packet that is sent to the server.
IV. Size of the packet that is received by your machine.

Answer 3



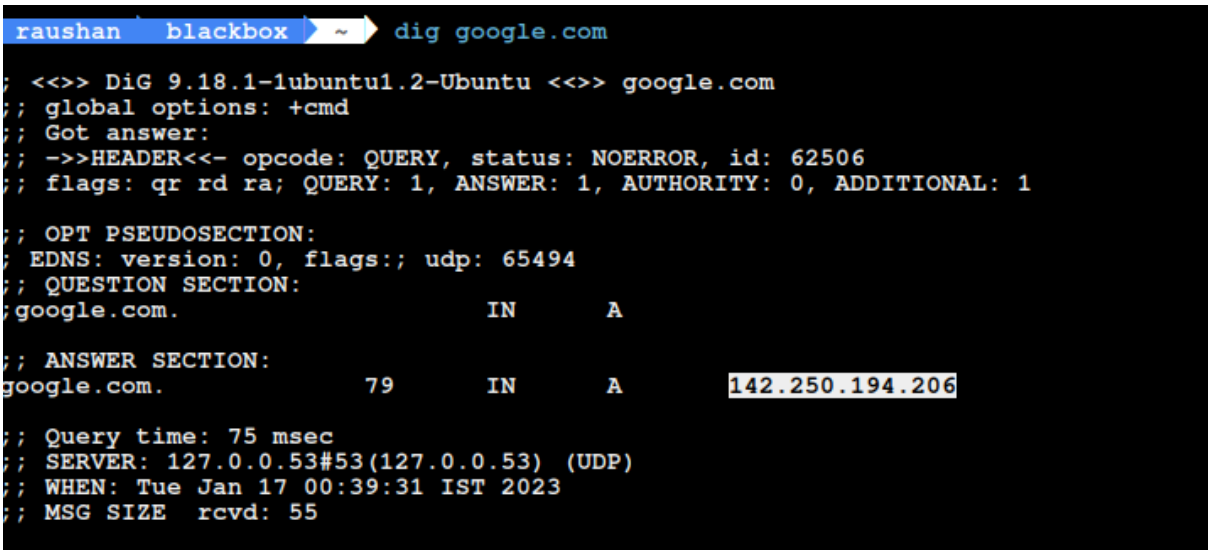
I. Average RTT is: 171.451 ms
II. Packet Loss is: 0%
III. Size of the packet sent to google.com is: 56 bytes .
IV. Size of the packet received is: 64 bytes .

Question 4

Use the dig command and find out.

I. the IP address of .
II. the IP addresses of DNS servers.

Answer 4



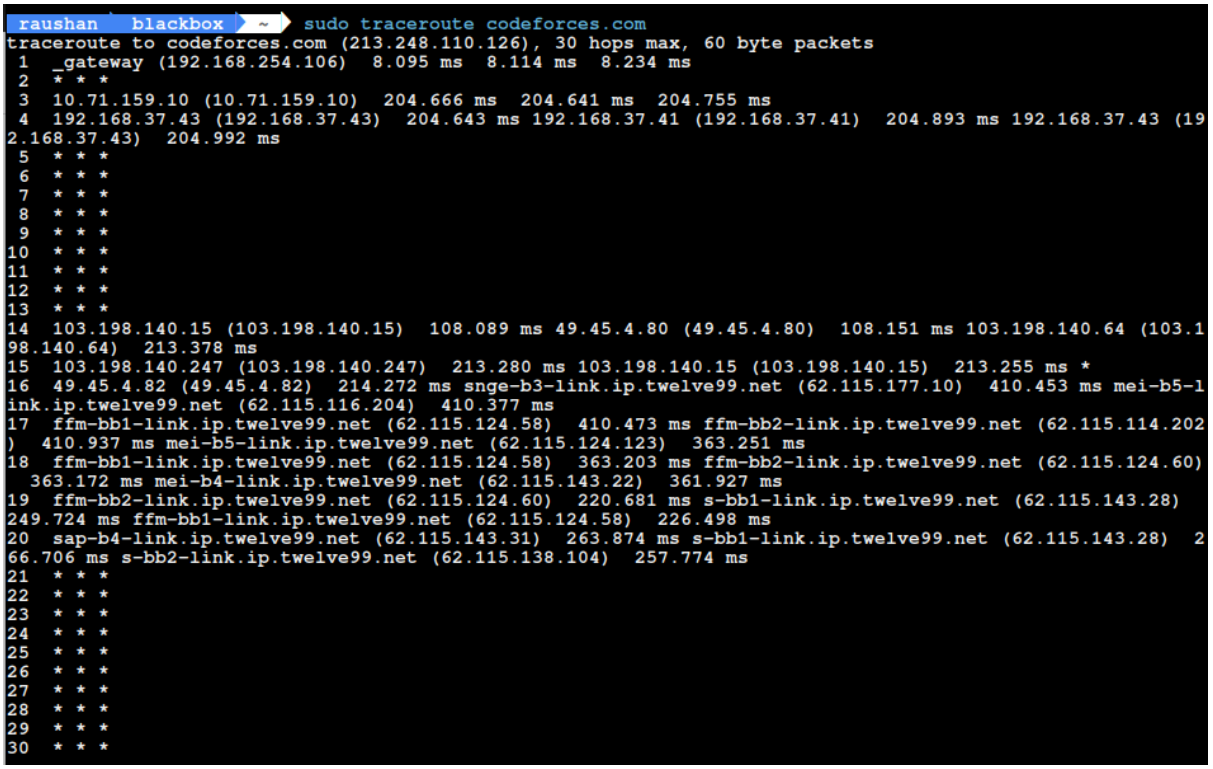
1. The IP Address of github.com is: 142.250.194.206
2. The IP Address of the DNS server is: 127.0.0.53

Question 5

Use traceroute and find out.

1. number of hops in between your machine and server.
2. the IP address of your network gateway of your subnet.

Answer 5



1. Number of hops between my machine and github.com is: 30 .
2. The IP address of my network gateway is: 192.168.254.106 .

Question 6

Use arp command to find out the MAC address of the device that is performing as your network gateway.

Answer 6

```
raushan  blackbox  ~  arp
Address                  HWtype  HWaddress           Flags Mask            Iface
_gateway                 ether   26:c9:60:5d:6b:6e   C                     wlp4s0
```

MAC address of the device that is performing as my network gateway is: 26:c9:60:5d:6b:6e

Question 7

Use nslookup command and find out the IP address of .Use nslookup command and perform reverse domain lookup.

Answer 7

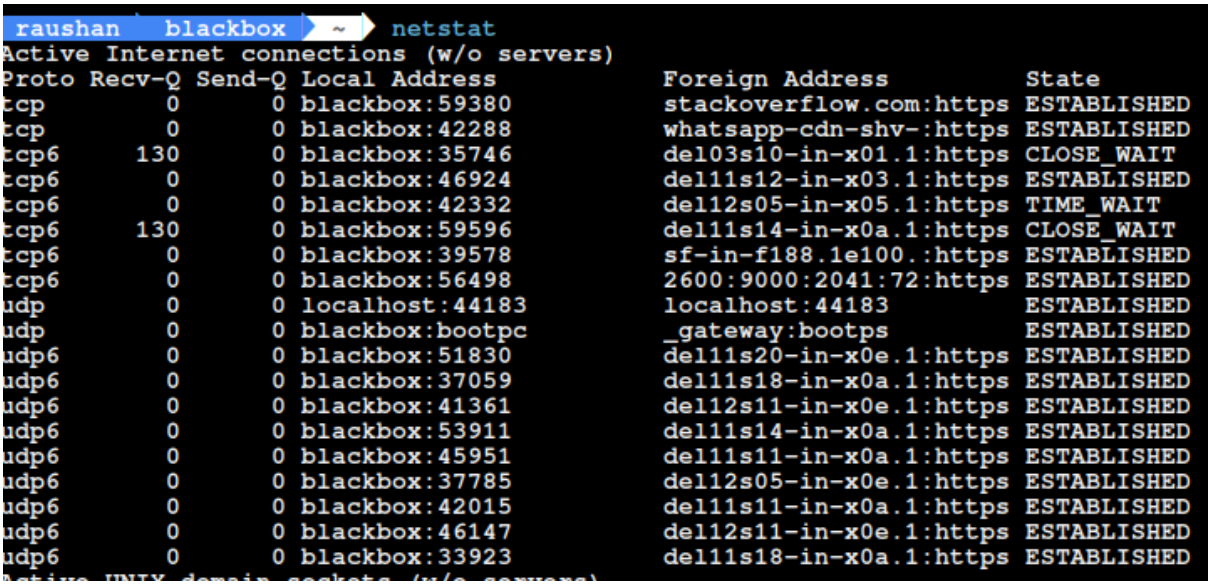
```
raushan  blackbox  ~  nslookup codeforces.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   codeforces.com
Address: 213.248.110.126


raushan  blackbox  ~  nslookup 213.248.110.126
126.110.248.213.in-addr.arpa    name = 213-248-110-126.teliacarrier-cust.com.

Authoritative answers can be found from:
```

- The IP address of codeforces.com is 213.248.110.126
- Doing a reversse domain lookup I got: 213-248-110-126.teliacarrier-cust.com.

Question 8

Use netstat command and find out the active connections of your machine.

Answer 8


raushan blackbox ~ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address Foreign Address State
tcp 0 0 blackbox:59380 stackoverflow.com:https ESTABLISHED
tcp 0 0 blackbox:42288 whatsapp-cdn-shv-:https ESTABLISHED
tcp6 130 0 blackbox:35746 del03s10-in-x01.1:https CLOSE_WAIT
tcp6 0 0 blackbox:46924 del11s12-in-x03.1:https ESTABLISHED
tcp6 0 0 blackbox:42332 del12s05-in-x05.1:https TIME_WAIT
tcp6 130 0 blackbox:59596 del11s14-in-x0a.1:https CLOSE_WAIT
tcp6 0 0 blackbox:39578 sf-in-f188.1e100.:https ESTABLISHED
tcp6 0 0 blackbox:56498 2600:9000:2041:72:https ESTABLISHED
udp 0 0 localhost:44183 localhost:44183 ESTABLISHED
udp 0 0 blackbox:bootpc _gateway:bootps ESTABLISHED
udp6 0 0 blackbox:51830 del11s20-in-x0e.1:https ESTABLISHED
udp6 0 0 blackbox:37059 del11s18-in-x0a.1:https ESTABLISHED
udp6 0 0 blackbox:41361 del12s11-in-x0e.1:https ESTABLISHED
udp6 0 0 blackbox:53911 del11s14-in-x0a.1:https ESTABLISHED
udp6 0 0 blackbox:45951 del11s11-in-x0a.1:https ESTABLISHED
udp6 0 0 blackbox:37785 del12s05-in-x0e.1:https ESTABLISHED
udp6 0 0 blackbox:42015 del11s11-in-x0a.1:https ESTABLISHED
udp6 0 0 blackbox:46147 del12s11-in-x0e.1:https ESTABLISHED
udp6 0 0 blackbox:33923 del11s18-in-x0a.1:https ESTABLISHED