231901502

EX NO :1B Linux Networking Commands

AIM:

Every computer is connected to some other computer through a network whether internally or externally to exchange some information. This network can be small as some computers connected in your home or office, or can be large or complicated as in large University or the entire Internet.

PROCEDURE:

Maintaining a system's network is a task of System/Network administrator. Their task includes network configuration and troubleshooting.

Here is a list of Networking and Troubleshooting commands:

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ifconfig	Display and manipulate route and network interfaces.	
<u>ip</u>	It is a replacement of ifconfig command.	
traceroute	Network troubleshooting utility.	
tracepath	Similar to traceroute but doesn't require root privileges.	
ping	To check connectivity between two nodes.	
netstat	Display connection information.	
<u>ss</u>	It is a replacement of netstat.	
dig	Query DNS related information.	
<u>nslookup</u>	Find DNS related query.	
route	Shows and manipulate IP routing table.	
host	Performs DNS lookups.	

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<u>arp</u>	View or add contents of the kernel's ARP table.
iwconfig	Used to configure wireless network interface.

hostname	To identify a network name.
curl or wget	To download a file from internet.
mtr	Combines ping and tracepath into a single command.
whois	Will tell you about the website's whois.
ifplugstatus	Tells whether a cable is plugged in or not.

Explanation of the above commands:

1. **ifconfig:** ifconfig is short for interface configurator. This command is utilized in network inspection, initializing the interface, enabling or disabling an IP address, and configuring an interface with an IP address. Also, it is used to show the network and route interface.

The basic details shown with if config are:

- · MTU
- · MAC address
- · IP address

Syntax:

Ifconfig

```
rmot@ip-10-10-38-111: # Lfconfig
docker0: flags=4163<UP.BROADCAST.RUNMING.MULTICAST> ntv 1580
lnet 172.17.0.1 netmask 255.255.8.8 broadcast 172.17.255.255
lnet6 fe80::42:16ff:fec8:24d5 prefixlen 64 scopeid 8x20<link>
            ether 02:42:10:c8:24:d5 txqueuelen 0 (Ethernet)
            RX packets 0 bytes 0 (0.0 8)
RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 35 bytes 4701 (4.7 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
ens5: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 9001
inet 18.18.38.111 netmask 255.255.8.6 broadcast 18.18.255.255
inet6 fe88::4a:89ff:fe31:79dd prefixlen 64 scopeid 8x26<link>
            ether #2:4a:89:31:79:dd txqueuelen 1000 (Ethernet)
#X packets #907 bytes 715564 (715.5 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
TX packets 6750 bytes 4150010 (4.1 MB)
            TX errors 8 dropped 0 overruns 0 carrier 0 collistons 0
   : flags=73<UP,LOOPBACK,RUNNING> Atu 65536
            inet 127.8.8.1 netmask 255.8.8.8
            inet0 ::1 prefixien 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
            RX packets 15765 bytes 4686788 (4.6 MB)
            RX errors 0 dropped 0 overruns 0 frame 0
TX packets 15766 bytes 4686788 (4.6 MB)
            TX errors @ dropped @ overruns @ carrier @ collisions @
veth9ddb7c8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> wtu 1580
            tnet6 fe88::548c:a4ff:fe12:a53b prefixlen 64 scopetd 8x20<link>
ether 56:0c:a4:12:a5:3b txqueuelen 0 (Ethernet)
            AX packets 0 bytes 0 (0.0 B)
            RX errors 0 dropped 0 overruns 0 frame 0
TX packets 57 bytes 7476 (7.4 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
vethf098cf2: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  htv 1500
            inet6 fe86::18a6:daff:fe84:d9f2 prefixlen 64 scopeid 8x20<link>
ether 12:a6:da:84:d9:f2 txqueuelen 8 (Ethernet)
            HX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 58 bytes 7560 (7.5 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

2. ip: It is the updated and latest edition of ifconfig command. The command provides the information of every network, such as ifconfig. Also, it can be used to get informationabout a particular interface.

Syntax:

- 1. ip a
- 2. ip addr

```
File Edit View Search Terminal Help
veth9ddb7c8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> ntu 1500
        lnet6 fe88::540c:a4ff:fe12:a53b prefixlen 64 scopetd 8x20<link>
ether 56:8c:a4:32:a5:3b txqueuelen 0 (Ethernet)
        RX packets 0 bytes 0 (0.0 B)
        RX errors 8 dropped 8 overruns 8 frame 8
TX packets 57 bytes 7476 (7.4 KB)
        TX errors 0 dropped 0 overruns 0 carrier 0 callisions 0
vethf698cf2: flags=4163<UP,8ROADCAST,RUNNING,MULTICAST> mtu IS80
        inet6 fe88::18a6:daff:fe84:d9f2 prefixlen 64 scopeid 8x26<link>
        ether 12:a6:da:84:d9:f2 txqueuelen 0 (Ethernet)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 58 bytes 7566 (7.5 KB)
        TX errors 0 dropped 0 overruns 8 carrier 8 collisions 8
ontgip-10-18-38-111:-# tp a
 : lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default glen 1868
    link/loopback 60:00:00:00:00:00:00 brd 80:00:00:00:00:00:00
    inet 127.0.0.1/8 scope host to
      valid_lft forever preferred_lft forever
    Ineto 1:1/128 scope host
       valid_lft forever preferred_lft forever
2: ens5: <BROADCAST,MULTICAST,UP,LOWER UP> ntw 9601 qdisc ng state UP group default glen 1860
    link/ether 02:4a:89:31:79:dd brd ff:ff:ff:ff:ff:ff
    inet 10.10.38.111/16 brd 10.10.255.255 scope global dynamic ens5
       valid_lft 2768sec preferred_lft 2768sec
    inet6 fe86::4a:80ff:fe31:79dd/64 scope link
valid_lft forever preferred_lft forever
3: docker0: <BRDADCAST,MULTICAST,UP,LOWER_UP> ntu 1500 qdisc noqueue state UP group default
    link/ether 02:42:10:c8:24:d5 brd ff:ff:ff:ff:ff:ff
    inet 172.17.8.1/16 brd 172.17.255.255 scope global docker8
       valld_lft forever preferred_lft forever
    inet6 fe80::42:16ff:fec8:24d5/64 scope link
       valld_lft forever preferred_lft forever
5: vethf098cf2gif4: <BRDADCAST,MULTICAST,UP.LOWER UP> mtu 1500 qdisc noqueue master docker0 state UP grou
    link/ether 12:a6:da:84:d9:f2 brd ff:ff:ff:ff:ff:ff link-netnsid 8
    inet6 fe80::18a6:daff:fe84:d9f2/64 scope link
       valid_ift forever preferred_ift forever
 : veth9ddb7c8@if6: <BROADCAST,MULTICAST,UP,LOWER_UP> mtw 1500 gdisc noqueue master docker0 state UP grow
    link/ether 56:8c:a4:12:a5:3b brd ff:ff:ff:ff:ff:ff link-netnsid 1
    inet6 fe80::546c:a4ff:fe12:a53b/64 scope link
valid_lft forever preferred_lft forever root@ip-10-10-30-111:-#
 + U - O THM AttackBox
```

- 3. **traceroute:** The traceroute command is one of the most helpful commands in the networking field. It's used to balance the network. It identifies the delay and decides the pathway to our target. Basically, it aids in the below ways:
 - · It determines the location of the network latency and informs it.
 - · It follows the path to the destination.
 - · It gives the names and recognizes all devices on the path.

Syntax:

traceroute <destination>

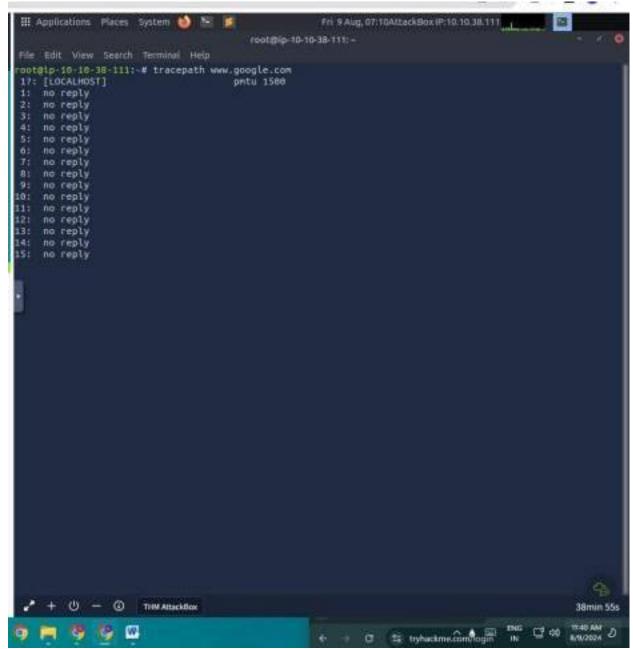
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4. **tracepath:** The tracepath command is the same as the traceroute command, and it is used to find network delays. Besides, it does not need root privileges. By default, it comes pre-installed in Ubuntu. It traces the path to the destination and recognizes all hops in it. It identifies the point at which the network is weak if our network is not strong enough.

Syntax:

tracepath <destination>

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5. **ping:** It is short for Packet Internet Groper. The ping command is one of the widely used commands for network troubleshooting. Basically, it inspects the network connectivity between two different nodes.

Syntax:

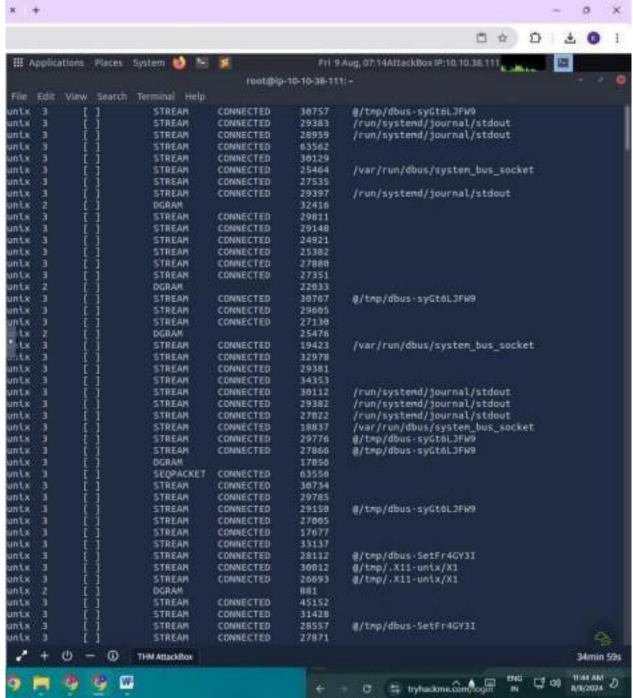
ping <destination>

```
[-N nodeinfo_option] [-p pattern] [-0 tclass] [-s packetsize] 
[-S sndbuf] [-t ttl] [-T timestamp_option] [-w deadline] 
[-W timeout] destination
 oot@ip-10-10-18-111:-# ping 10,10.38.
ping: 10.10.38.: Name or service not known
 oot@ip-10-10-38-111; # ping 10.10.38.111
 ING 10.10.38.111 (10.10.38.111) 56(84) bytes of data.
 4 bytes from 10.10.38.111: icmp_seq=1 ttl=64 time=0.042 ms
54 bytes from 10.10.38.111: tcmp_seq=2 ttl=64 time=0.037 ms
14 bytes from 10.10.38.111: tcmp_seq=3 ttl=64 time=0.027 ms
 4 bytes from 16.18.38.111: icmp_seq=4 ttl=64 time=0.829 ms
 4 bytes from 10.10.38.111: \text{icmp_seq=5 ttl=64 time=0.023 ms} 4 bytes from 10.10.38.111: \text{icmp_seq=0 ttl=64 time=0.044 ms}
   bytes from 18.18.38.111: 1cmp_seq=7 ttl=64 tlme=8.825 ms
  bytes from 10.10.38.111: icnp_seq=8 ttl=64 time=0.027 ms
bytes from 10.10.38.111: icmp_seq=9 ttl=64 time=0.032 ms
   bytes from 10.10.38.111: \cmp_seq=10 ttl=64 time=0.025 ms
   bytes from 10.10.38.111: icmp seq=11 ttl=64 time=8.035 ms
bytes from 10.10.38.111: icmp seq=12 ttl=64 time=8.029 ms
 4 bytes From 10.10.38.111: lcmp_seq=13 ttl=64 tlme=8.641 ms
4 bytes From 10.10.38.111: lcmp_seq=14 ttl=64 tlme=8.044 ms
   bytes from 10.10.38.111: icmp_seq=15 ttl=64 time=0.039 ms
 4 bytes from 10.10.38.111: lcmp_seq=16 ttl=64 tlme=8.030 ms
4 bytes from 10.10.38.111: lcmp_seq=17 ttl=64 tlme=8.040 ms
   bytes from 10.10.38.111: icmp_seq=18 ttl=64 time=8.027
 4 bytes From 10.10.38.111: lcmp_seq=19 ttl=64 tlme=8.042 ms
4 bytes from 10.10.38.111: lcmp_seq=20 ttl=64 tlme=8.042 ms
 4 bytes from 10.10.38.111: icmp_seq=21 ttl=64 time=0.027
   bytes from 10.10.38.111: icmp_seq=22 ttl=64 time=8.025
bytes from 10.10.38.111: icmp_seq=23 ttl=64 time=8.037
 4 bytes from 10.10.38.111: icmp_seq=24 ttl=64 time=8.042 ms
   bytes from 10.10.38.111: icnp_seq=25 ttl=64 time=0.181
   bytes From 10.10.38.111: 1cmp_seq=26 ttl=64 time=0.028
 4 bytes from 10.10.38.111: icnp_seq=27 ttl=64 time=8.043 ms
   bytes from 10.10.38.111: lcmp_seq=28 ttl=64 time=0.025 ms
   bytes from 10.10.38.111: lcmp_seq=29 ttl=64 time=0.032 ms
 4 bytes from 10.10.38.111: icmp_seq=30 ttl=64 time=8.031 ms
 4 bytes from 10.10.38.111: icmp_seq=31 ttl=64 time=0.047 ms
     18.18.38.111 ping statistics --
31 packets transmitted, 31 received, 8% packet loss, time 30723ms
 tt mln/avg/max/mdev = 0.023/0.038/0.181/0.027 ms
 oot@ip-10-10-38-111: #
       + (b) - (i) THM AttackBox
                                                                                                                                 37min 11s
                                                                                                                                11:42 MM
                                                                                      tryhackme.com
```

netstat: It is short for network statistics. It gives statistical figures of many interfaces, which contain open sockets, connection information, and routing tables.

Syntax:

Netstat

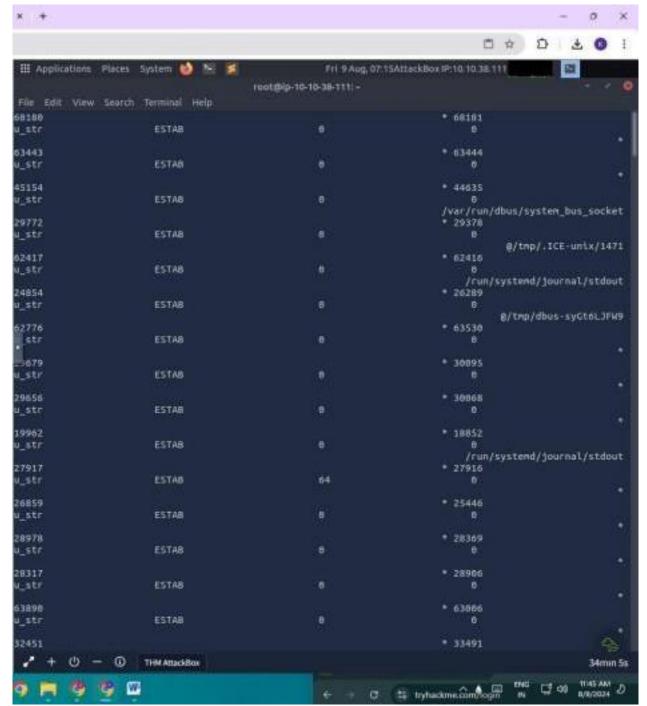


7. **ss:** This command is the substitution for the netstat command. The ss command is more informative and much faster than netstat. The ss command's faster response is possible because it fetches every information from inside the kernel userspace.

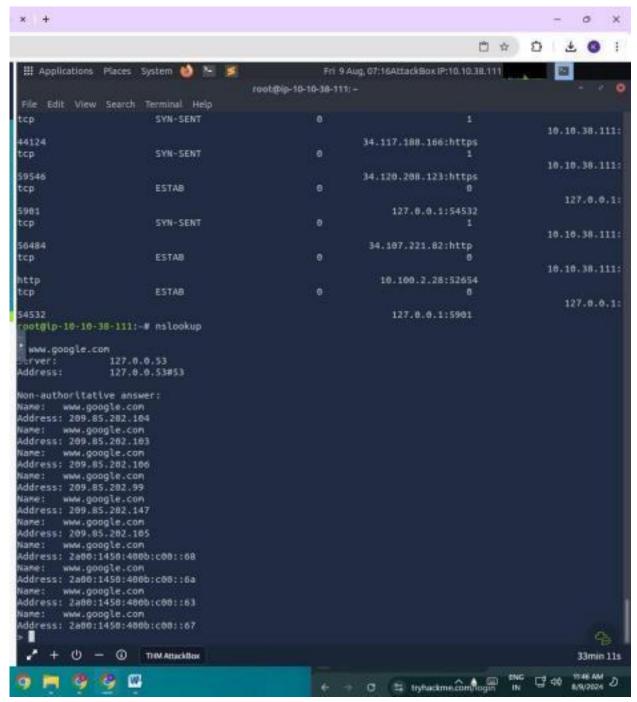
Syntax:

Ss

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8. **nsloopup:** The nslookup command is an older edition of the dig command. Also, it is utilized for DNS related problems.



Syntax:

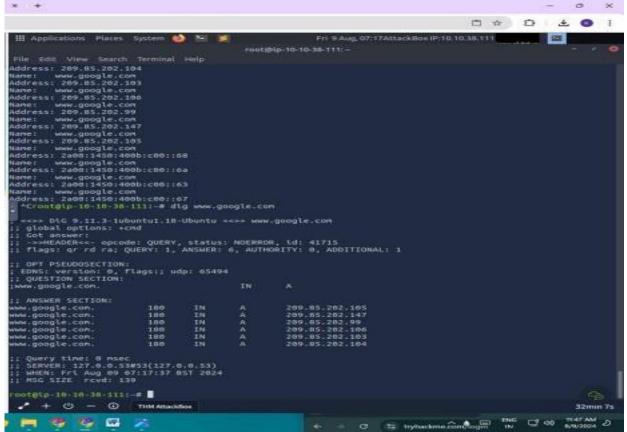
nslookup <domainname>

9. **dig:** dig is short for Domain Information Groper. The dig command is an improvised edition of the nslookup command. It is utilized in DNS lookup to reserve the DNS name server. Also, it is used to balance DNS related problems. Mainly, it is used to authorize DNS mappings, host addresses, MX records, and every other DNS record for the best DNS topography understanding.

Syntax:

dig <domainname>

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10. **route:** The route command shows and employs the routing table available for our system. Basically, a router is used to detect a better way to transfer the packets around a destination.

Syntax:

Route

11. **host:** The host command shows the IP address for a hostname and the domain name for an IP address. Also, it is used to get DNS lookup for DNS related issues.

Syntax:

host -t <resourceName>

arp: The arp command is short for Address Resolution Protocol. This commandis used Syntax:

1. Arp

1.**iwconfig:** It is a simple command which is used to see and set the system's hostname.

Syntax:

Hostname

2. **curl and wget:** These commands are used to download files from CLI from the internet. curl must be specified with the "O" option to get the file, while wget is directly used.

curl Syntax:

1. curl -O <fileLink>

3. wget

Syntax:

- 1. wget <fileLink>
 - 1. **mtr:** The mtr command is a mix of the traceroute and ping commands. It regularly shows to see and include content in the ARP table of the kernel. information related to the packets transferred using the ping time of all hops. Also, it is used to see network problems.

Syntax:

- 1. mtr **<path>**
 - 2. **whois:** The whois command fetches every website related information. We can get every information of a website, such as an owner and the registration information.

Syntax:

- 1. mtr <websiteName>
 - 3. **ifplugstatus:** The ifplugstatus command checks whether a cable is currently plugged into a network interface. It is not available in Ubuntu directly. We can install it with the help of the below command:
- 1. sudo apt-get install ifplugd

Syntax:

1. Ifplugstatus

iftop: The iftop command is utilized in traffic monitoring.

tcpdump: The tcpdump command is widely used in network analysis with other commands of the Linux network. It analyses the traffic passing from the network interface and shows it. When balancing the network, this type of packet access will be crucial.

SYNTAX:

1. \$ tcpdump -i < network_device>

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