Networking Lab Assignment 2

Basics of Network configurations files and Networking Commands in Linux.

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1 Basics of Network configurations files and Networking Commands in Linux.

1.1 Aim

Getting started with Basics of Network configurations files and Networking Commands in Linux.And understand the usage of these commands.

1.2 Theory

Following is a list of basic Linux commands used for networking.

1.2.1 ifconfig

ifconfig stands for "interface configuration". It is used to view and change the configuration of the network interfaces on your system.

```
┌─user9747@debian ~
└─$ sudo ifconfig
enp3s0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        ether 70:5a:0f:b3:1a:68  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1  (Local Loopback)
        RX packets 921  bytes 225107 (219.8 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 921  bytes 225107 (219.8 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

wlo1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.9  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::c12b:3ca0:8242:fce4  prefixlen 64  scopeid 0x20<link>
        ether 44:1c:a8:6a:bb:69  txqueuelen 1000  (Ethernet)
        RX packets 29947  bytes 25093794 (23.9 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 24396  bytes 3458874 (3.2 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

1.2.2 ping

Ping is used to check the connectivity status between a source and a destination computer/device over an IP network. It also helps you assess the time it takes to send and receive a response from the network.

```
┌─user9747@debian ~
└─$ ping google.com
PING google.com (172.217.163.46) 56(84) bytes of data.
64 bytes from maa05s01-in-f14.1e100.net (172.217.163.46): icmp_seq=1 ttl=53 time=14.9 ms
64 bytes from maa05s01-in-f14.1e100.net (172.217.163.46): icmp_seq=2 ttl=53 time=14.7 ms
^C
--- google.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 14.717/14.811/14.905/0.094 ms
```

1.2.3 traceroute

is a tool used to find the route taken by packets over an IP network and the delays it has.

```
┌─user9747@debian ~
└─$ traceroute facebook.com
traceroute to facebook.com (157.240.13.35), 30 hops max, 60 byte packets
 1  192.168.1.1 (192.168.1.1)  2.818 ms  2.781 ms  2.742 ms
 2  192.168.99.1 (192.168.99.1)  21.020 ms  21.042 ms  21.125 ms
 3  edge-star-mini-shv-02-sin6.facebook.com (157.240.13.35)  21.318 ms  21.520 ms  21.554 ms
```

1.2.4 netstat

Prints network connection,ip tables and network interface statistics and information about the Linux networking subsystem.

```
┌─user9747@debian ~
└─$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 192.168.1.9:33154       maa05s01-in-f4.1e:https ESTABLISHED
tcp        0      0 192.168.1.9:51120       li1276-213.member:https ESTABLISHED
tcp        0      0 192.168.1.9:52150       ec2-34-193-74-88.:https ESTABLISHED
tcp        0      0 192.168.1.9:52124       ec2-34-193-74-88.:https ESTABLISHED
tcp        0      0 192.168.1.9:57544       hong-kong-19.cdn7:https TIME_WAIT
tcp        0      0 192.168.1.9:52196       li1276-213.member:https ESTABLISHED
^C
```

1.2.5 nslookup

is a tool used to find DNS lookups in Linux and prints ip address of the specific device,MX records and domain name ip address mapping.

```
┌─user9747@debian ~
└─$ nslookup google.com
Server:         192.168.1.1
Address:        192.168.1.1#53

Non-authoritative answer:
Name:   google.com
Address: 216.58.197.46
```

1.2.6 route

used to show and manipulate routing tables.When the add or del options are used, route modifies the routing tables. Without these options, route displays the current con-tents of the routing tables.

```
┌─user9747@debian ~
└─$ sudo route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         192.168.1.1     0.0.0.0         UG    600    0        0 wlo1
link-local      0.0.0.0         255.255.0.0     U     1000   0        0 wlo1
192.168.1.0     0.0.0.0         255.255.255.0   U     600    0        0 wlo1
```

1.2.7 dig

A DNS lookup tool used to query and troubleshoot DNS problems.

```
┌─user9747@debian ~
└─$ dig 172.217.163.174

; <<>> DiG 9.10.3-P4-Debian <<>> 172.217.163.174
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 32280
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;172.217.163.174.               IN      A

;; AUTHORITY SECTION:
.                       86387   IN      SOA     a.root-servers.net. nstld.verisign-grs.com. 2019020400 1800 900 604800 86400

;; Query time: 91 msec
;; SERVER: 192.168.1.1#53(192.168.1.1)
;; WHEN: Mon Feb 04 19:14:12 IST 2019
;; MSG SIZE  rcvd: 119
```

1.2.8 arp

Tool used to show and modify ARP(Address resolution protocol) cache.An ARP cache is a simple mapping of IP addresses to MAC addresses.

```
┌─user9747@debian ~
└─$ sudo arp
Address                  HWtype  HWaddress           Flags Mask            Iface
192.168.1.1              ether   20:4e:7f:13:ea:74   C                     wlo1
```

1.2.9 ethtool

is Network Interface card configuration tool.Used to change NIC settings.

```
┌─user9747@debian ~
└─$ sudo ethtool wlo1
Settings for wlo1:
        Link detected: yes
```

1.2.10 hostname

used to display systems DNS name and display and change its hostname.

```
user9747@debian ~
$ hostname
debian
```

1.2.11 host

A DNS lookup tool.Normally used to convert names to ip addresses.When no arguments or options are given, host prints a short summary of its command line arguments and options.

```
user9747@debian ~
$ host google.com
google.com has address 172.217.163.174
google.com has IPv6 address 2404:6800:4007:810::200e
google.com mail is handled by 30 alt2.aspmx.l.google.com.
google.com mail is handled by 10 aspmx.l.google.com.
google.com mail is handled by 50 alt4.aspmx.l.google.com.
google.com mail is handled by 40 alt3.aspmx.l.google.com.
google.com mail is handled by 20 alt1.aspmx.l.google.com.
```

1.3 Result

Successfully executed above commands and output verified on Debian 4.9