name: mahmoud hassan amin   track:IOT

.Display your MAC address by 2 different ways

```
[Eng.mahmoud@localhost ~]$ ifconfig
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 1000  (Local Loopback)
        RX packets 17  bytes 1456 (1.4 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 17  bytes 1456 (1.4 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

virbr0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 192.168.122.1  netmask 255.255.255.0  broadcast 192.168.122.255
        ether 52:54:00:7f:38:4d  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

wlp0s20f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.204.27.14  netmask 255.255.252.0  broadcast 10.204.27.255
        inet6 fe80::c093:e6e6:7eb9:49d8  prefixlen 64  scopeid 0x20<link>
        ether f4:d1:08:55:7b:f2  txqueuelen 1000  (Ethernet)
        RX packets 7701  bytes 806536 (787.6 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 2813  bytes 344336 (336.2 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
[Eng.mahmoud@192 ~]$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
   link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
   inet 127.0.0.1/8 scope host lo
      valid_lft forever preferred_lft forever
   inet6 ::1/128 scope host
      valid_lft forever preferred_lft forever
2: wlp0s20f3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
   link/ether f4:d1:08:55:7b:f2 brd ff:ff:ff:ff:ff:ff
   inet 192.168.1.6/24 brd 192.168.1.255 scope global dynamic noprefixroute wlp0s20f3
      valid_lft 84823sec preferred_lft 84823sec
   inet6 fe80::1878:b8b2:5f73:6ac3/64 scope link noprefixroute
      valid_lft forever preferred_lft forever
3: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
   link/ether 52:54:00:7f:38:4d brd ff:ff:ff:ff:ff:ff
   inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
      valid_lft forever preferred_lft forever
```

.Display the network settings of all active interfaces .2

```
[Eng.mahmoud@localhost ~]$ ifconfig
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 1000  (Local Loopback)
        RX packets 17  bytes 1456 (1.4 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 17  bytes 1456 (1.4 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

virbr0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 192.168.122.1  netmask 255.255.255.0  broadcast 192.168.122.255
        ether 52:54:00:7f:38:4d  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

wlp0s20f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.204.27.14  netmask 255.255.252.0  broadcast 10.204.27.255
        inet6 fe80::c093:e6e6:7eb9:49d8  prefixlen 64  scopeid 0x20<link>
        ether f4:d1:08:55:7b:f2  txqueuelen 1000  (Ethernet)
        RX packets 8088  bytes 849497 (829.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 3109  bytes 379514 (370.6 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

.Display the network setting of all interfaces both active inactive .3

```
[Eng.mahmoud@localhost ~]$ ifconfig -a
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 1000  (Local Loopback)
        RX packets 17  bytes 1456 (1.4 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 17  bytes 1456 (1.4 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

virbr0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 192.168.122.1  netmask 255.255.255.0  broadcast 192.168.122.255
        ether 52:54:00:7f:38:4d  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

wlp0s20f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.204.27.14  netmask 255.255.252.0  broadcast 10.204.27.255
        inet6 fe80::c093:e6e6:7eb9:49d8  prefixlen 64  scopeid 0x20<link>
        ether f4:d1:08:55:7b:f2  txqueuelen 1000  (Ethernet)
        RX packets 8104  bytes 850865 (830.9 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 3110  bytes 379628 (370.7 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

.Bring your interface down .4

```
[Eng.mahmoud@localhost ~]$ sudo ifconfig wlp0s20f3 down
[Eng.mahmoud@localhost ~]$ ifconfig
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 1000  (Local Loopback)
        RX packets 17  bytes 1456 (1.4 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 17  bytes 1456 (1.4 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

virbr0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 192.168.122.1  netmask 255.255.255.0  broadcast 192.168.122.255
        ether 52:54:00:7f:38:4d  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

[Eng.mahmoud@localhost ~]$
```

.Configure your network card to have static IP .5

```
[Eng.mahmoud@localhost ~]$ sudo ifconfig wlp0s20f3 172.16.25.125
[Eng.mahmoud@localhost ~]$ ifconfig
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 1000  (Local Loopback)
        RX packets 17  bytes 1456 (1.4 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 17  bytes 1456 (1.4 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

virbr0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 192.168.122.1  netmask 255.255.255.0  broadcast 192.168.122.255
        ether 52:54:00:7f:38:4d  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

wlp0s20f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 172.16.25.125  netmask 255.255.0.0  broadcast 172.16.255.255
        inet6 fe80::eda:7ada:b878:3ac1  prefixlen 64  scopeid 0x20<link>
        ether f4:d1:08:55:7b:f2  txqueuelen 1000  (Ethernet)
        RX packets 9214  bytes 1325088 (1.2 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 4081  bytes 563959 (550.7 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

.Bring your interface up .6

```
[Eng.mahmoud@192 ~]$ sudo ifconfig wlp0s20f3 up
[Eng.mahmoud@192 ~]$
```

Verify your network setting using ifconfig command

```
[Eng.mahmoud@192 ~]$ sudo ifconfig wlp0s20f3
wlp0s20f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.6  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::a2f:5eae:855:17be  prefixlen 64  scopeid 0x20<link>
        ether f4:d1:08:55:7b:f2  txqueuelen 1000  (Ethernet)
        RX packets 332070  bytes 444028576 (423.4 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 142140  bytes 20566860 (19.6 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

.Configure your network card to have dynamic IP using network manager command .

```
[Eng.mahmoud@192 ~]$ nmcli con mod Mobinil-Elasad ipv4.method auto
```

.Check using ifconfig then check its configuration file .9

```
[Eng.mahmoud@192 ~]$ sudo ifconfig
[sudo] password for Eng.mahmoud:
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 1000  (Local Loopback)
        RX packets 34  bytes 2620 (2.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 34  bytes 2620 (2.5 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

virbr0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 192.168.122.1  netmask 255.255.255.0  broadcast 192.168.122.255
        ether 52:54:00:7f:38:4d  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

wlp0s20f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.6  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::a2f:5eae:855:17be  prefixlen 64  scopeid 0x20<link>
        ether f4:d1:08:55:7b:f2  txqueuelen 1000  (Ethernet)
        RX packets 339934  bytes 450407818 (429.5 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 147313  bytes 21806452 (20.7 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

.Reconfigure your network card using system-config-network utility to have static IP .10

```
ESSID=Mobinil-Elasad
MODE=Managed
KEY_MGMT=WPA-PSK
SECURITYMODE=open
MAC_ADDRESS_RANDOMIZATION=default
TYPE=Wireless
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=static
IPADDR=192.168.1.6
PREFIX=24
GATEWAY=192.168.0.254
DNS1=192.168.0.254
DEFROUTE=yes
IPV4_FAILURE_FATAL=no
IPV6INIT=yes
IPV6_AUTOCONF=yes
IPV6_DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=stable-privacy
NAME=Mobinil-Elasad
UUID=98c47e6e-b4a6-4a1c-93af-7c59c18252fe
DEVICE=wlp0s20f3
ONBOOT=yes
~
```

```
[Eng.mahmoud@192 ~]$ sudo vi /etc/sysconfig/network-scripts/ifcfg-Mobinil-Elasad
[Eng.mahmoud@192 ~]$
```

Configure your network card to have 3 IPs and check that they are all working using .11
ifconfig command

```
[Eng.mahmoud@192 ~]$ sudo ip addr add 192.168.2.105 dev wlp0s20f3
[Eng.mahmoud@192 ~]$ sudo ip addr add 192.168.2.105 dev wlp0s20f3
RTNETLINK answers: File exists
[Eng.mahmoud@192 ~]$ sudo ip addr add 192.168.2.10 dev wlp0s20f3
[Eng.mahmoud@192 ~]$ sudo ip addr add 192.168.2.1 dev wlp0s20f3
[Eng.mahmoud@192 ~]$
```

.Change your host name in your global network file .

```
# Created by anaconda
HOSTNAME=mahmoud.local
~
```

13. Check the present value of `/proc/sys/net/ipv4/icmp_echo_ignore_all`

```
[Eng.mahmoud@192 ~]$ cat /proc/sys/net/ipv4/icmp_echo_ignore_all
0
```

14. It should be 0, change it to 1 which will prevent other hosts from successfully pinging your host while not affecting your ability to ping them.

```
[root@192 ~]# sudo echo 1  > /proc/sys/net/ipv4/icmp_echo_ignore_all
[root@192 ~]# cat /proc/sys/net/ipv4/icmp_echo_ignore_all
1
```

15. Try to `ping` your colleague, let your colleague try to `ping` your host

```
[root@192 ~]# ping 192.168.1.123
PING 192.168.1.123 (192.168.1.123) 56(84) bytes of data.
From 192.168.1.6 icmp_seq=1 Destination Host Unreachable
From 192.168.1.6 icmp_seq=2 Destination Host Unreachable
From 192.168.1.6 icmp_seq=3 Destination Host Unreachable
From 192.168.1.6 icmp_seq=4 Destination Host Unreachable
From 192.168.1.6 icmp_seq=5 Destination Host Unreachable
From 192.168.1.6 icmp_seq=6 Destination Host Unreachable
[root@192 ~]# ping 127.0.0.1
PING 127.0.0.1 (127.0.0.1) 56(84) bytes of data.
```

16. Reboot and try the last step. What happened? Why?

```
[root@192 ~]# ping 127.0.0.1
PING 127.0.0.1 (127.0.0.1) 56(84) bytes of data.
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.103 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.090 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.084 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.038 ms
64 bytes from 127.0.0.1: icmp_seq=5 ttl=64 time=0.093 ms
```

because all changes is temporary

17. Edit `/etc/sysctl.conf` and put the following line at the bottom:
`net.ipv4.icmp_echo_ignore_all=1`

```
# sysctl settings are defined through files in
# /usr/lib/sysctl.d/, /run/sysctl.d/, and /etc/sysctl.d/.
#
# Vendors settings live in /usr/lib/sysctl.d/.
# To override a whole file, create a new file with the same in
# /etc/sysctl.d/ and put new settings there. To override
# only specific settings, add a file with a lexically later
# name in /etc/sysctl.d/ and put new settings there.
#
# For more information, see sysctl.conf(5) and sysctl.d(5).
net.ipv4.icmp_echo_ignore_all=1
~
```

18. Execute `sysctl -p` command.

```
[Eng.mahmoud@192 ~]$ sysctl -p
sysctl: permission denied on key 'net.ipv4.icmp_echo_ignore_all'
```

19. Check the value of `/proc/sys/net/ipv4/icmp_echo_ignore_all`.

```
[Eng.mahmoud@192 ~]$ cat  /proc/sys/net/ipv4/icmp_echo_ignore_all
0
```