

3) Configure static IP addresses, modify MAC addresses, and verify network connectivity using ping and ifconfig commands.

Static IP Address

- A **Static IP address** is a manually assigned, fixed IP address that does not change over time. Unlike **Dynamic IPs** (assigned by DHCP), static IPs remain constant, ensuring reliable connectivity.
- Useful for servers, printers, and network devices requiring consistent addresses

Feature	Static IP	Dynamic IP
Assignment	Manually configured	Automatically via DHCP
Changes Over Time	No	Yes
Use Case	Servers, routers, remote access	Home users, temporary devices
Configuration	Requires manual setup	Assigned by the network

```

nekita-shri@nekita-shri-VirtualBox:~$ ip addr show
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 noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 08:00:27:9d:af:5e brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 86001sec preferred_lft 86001sec
    inet6 fd00::8075:f2f2:8c0c:6b9d/64 scope global temporary dynamic
        valid_lft 86004sec preferred_lft 14004sec
    inet6 fd00::73c3:41db:2152:3b54/64 scope global dynamic mngtmpaddr noprefixroute
        valid_lft 86004sec preferred_lft 14004sec
    inet6 fe80::76d4:10de:1303:fd6f/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
nekita-shri@nekita-shri-VirtualBox:~$ sudo ip addr add 192.168.1.101/24 dev enp0s3
nekita-shri@nekita-shri-VirtualBox:~$ sudo ip link set dev enp0s3 address 08:11:22:33:44:55
nekita-shri@nekita-shri-VirtualBox:~$ ip addr show enp0s3
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 08:11:22:33:44:55 brd ff:ff:ff:ff:ff:ff permaddr 08:00:27:9d:af:5e
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 85935sec preferred_lft 85935sec
    inet 192.168.1.101/24 scope global enp0s3
        valid_lft forever preferred_lft forever
    inet6 fd00::8075:f2f2:8c0c:6b9d/64 scope global temporary dynamic
        valid_lft 85938sec preferred_lft 13938sec
    inet6 fd00::73c3:41db:2152:3b54/64 scope global dynamic mngtmpaddr noprefixroute
        valid_lft 85938sec preferred_lft 13938sec
    inet6 fe80::76d4:10de:1303:fd6f/64 scope link noprefixroute

```

```

nekita-shri@nekita-shri-VirtualBox:~$ ping 192.168.1.101
PING 192.168.1.101 (192.168.1.101) 56(84) bytes of data.
64 bytes from 192.168.1.101: icmp_seq=1 ttl=64 time=0.068 ms
64 bytes from 192.168.1.101: icmp_seq=2 ttl=64 time=0.075 ms
64 bytes from 192.168.1.101: icmp_seq=3 ttl=64 time=0.083 ms
64 bytes from 192.168.1.101: icmp_seq=4 ttl=64 time=0.073 ms
64 bytes from 192.168.1.101: icmp_seq=5 ttl=64 time=0.079 ms
64 bytes from 192.168.1.101: icmp_seq=6 ttl=64 time=0.080 ms
64 bytes from 192.168.1.101: icmp_seq=7 ttl=64 time=0.135 ms
64 bytes from 192.168.1.101: icmp_seq=8 ttl=64 time=0.078 ms
64 bytes from 192.168.1.101: icmp_seq=9 ttl=64 time=0.079 ms
64 bytes from 192.168.1.101: icmp_seq=10 ttl=64 time=0.084 ms
64 bytes from 192.168.1.101: icmp_seq=11 ttl=64 time=0.075 ms
64 bytes from 192.168.1.101: icmp_seq=12 ttl=64 time=0.389 ms
64 bytes from 192.168.1.101: icmp_seq=13 ttl=64 time=0.088 ms
64 bytes from 192.168.1.101: icmp_seq=14 ttl=64 time=0.137 ms
64 bytes from 192.168.1.101: icmp_seq=15 ttl=64 time=0.085 ms
64 bytes from 192.168.1.101: icmp_seq=16 ttl=64 time=0.227 ms
64 bytes from 192.168.1.101: icmp_seq=17 ttl=64 time=0.119 ms
64 bytes from 192.168.1.101: icmp_seq=18 ttl=64 time=0.081 ms
64 bytes from 192.168.1.101: icmp_seq=19 ttl=64 time=0.084 ms
64 bytes from 192.168.1.101: icmp_seq=20 ttl=64 time=0.088 ms
64 bytes from 192.168.1.101: icmp_seq=21 ttl=64 time=0.385 ms
64 bytes from 192.168.1.101: icmp_seq=22 ttl=64 time=0.072 ms
64 bytes from 192.168.1.101: icmp_seq=23 ttl=64 time=0.084 ms
64 bytes from 192.168.1.101: icmp_seq=24 ttl=64 time=0.073 ms

```