Task 3: Networking Basics for DevOps

Objective

To understand basic networking concepts and analyze network configuration using Linux commands.

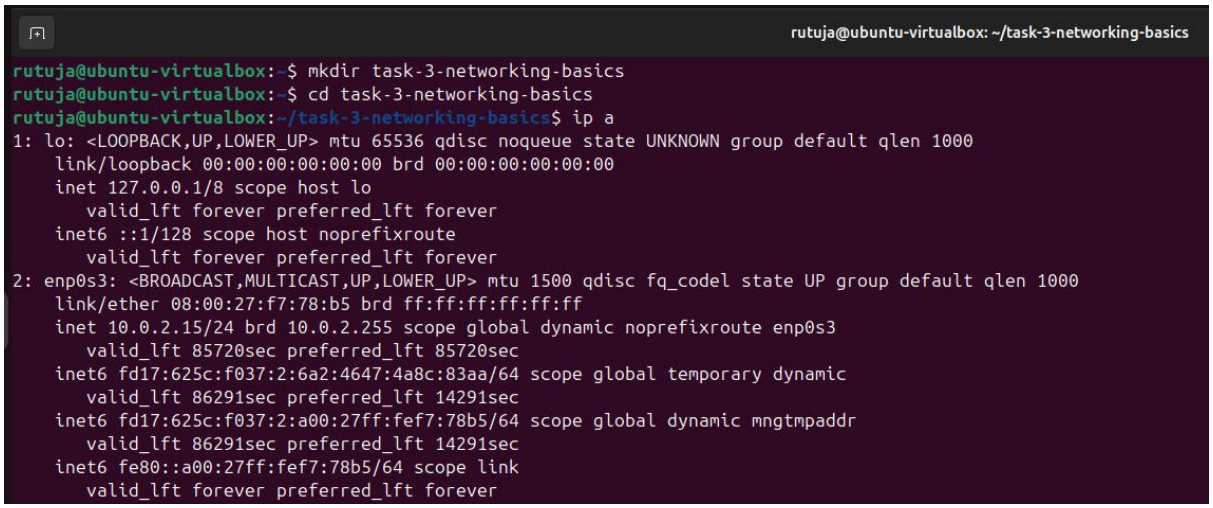
Tools Used

- Linux CLI

Experiments and Observations

Checking IP Address

The `ip a` command displays network interfaces and assigned IP addresses.



Network Connectivity Test

Ping was used to test connectivity to Google DNS (8.8.8.8).

```
rutuja@ubuntu-virtualbox:~/task-3-networking-basics$ ping -c 4 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=255 time=241 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=255 time=149 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=255 time=170 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=255 time=191 ms

--- 8.8.8.8 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3009ms
rtt min/avg/max/mdev = 148.941/187.581/240.800/34.063 ms
rutuja@ubuntu-virtualbox:~/task-3-networking-basics$
```

Open Ports and Services

The `ss` command was used to inspect open ports and services.

```
rutuja@ubuntu-virtualbox:~/task-3-networking-basics$ ss -tuln
Netid            State             Recv-Q            Send-Q                        Local Address:Port                      Peer Address:Port           Process
udp              UNCONN            0                 0                                   0.0.0.0:5353                           0.0.0.0:*
udp              UNCONN            0                 0                                   0.0.0.0:38278                          0.0.0.0:*
udp              UNCONN            0                 0                                127.0.0.54:53                             0.0.0.0:*
udp              UNCONN            0                 0                             127.0.0.53%lo:53                             0.0.0.0:*
udp              UNCONN            0                 0                                      [::]:5353                              [::]:*
udp              UNCONN            0                 0                                      [::]:48461                             [::]:*
tcp              LISTEN            0                 4096                             127.0.0.1:631                             0.0.0.0:*
tcp              LISTEN            0                 4096                          127.0.0.53%lo:53                             0.0.0.0:*
tcp              LISTEN            0                 511                                 0.0.0.0:80                             0.0.0.0:*
tcp              LISTEN            0                 4096                             127.0.0.54:53                             0.0.0.0:*
tcp              LISTEN            0                 511                                    [::]:80                                [::]:*
tcp              LISTEN            0                 4096                                   [::1]:631                              [::]:*
rutuja@ubuntu-virtualbox:~/task-3-networking-basics$
```

DNS Resolution

DNS resolution was tested using nslookup/dig.

```
rutuja@ubuntu-virtualbox:~/task-3-networking-basics$ nslookup google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   google.com
Address: 142.251.43.14
Name:   google.com
Address: 2404:6800:4009:826::200e

rutuja@ubuntu-virtualbox:~/task-3-networking-basics$
```

Network Path Tracing

Traceroute was used to identify the network path to a destination.

```
rutuja@ubuntu-virtualbox:~/task-3-networking-basics$ traceroute google.com
Command 'traceroute' not found, but can be installed with:
sudo apt install inetutils-traceroute  # version 2:2.4-3ubuntu1, or
sudo apt install traceroute            # version 1:2.1.5-1
rutuja@ubuntu-virtualbox:~/task-3-networking-basics$
```

Simulating Network Failure

Network failure can be simulated by disabling a network interface using the `ip link set <interface> down` command.