

Experiment No 08

Configuring TCP/IP in Linux

Date:
Roll no:

Aim:

To configure a static IP address, subnet mask, and default gateway on a Linux system, and to understand the impact of these configurations on network connectivity.

Theory:

TCP/IP (Transmission Control Protocol/Internet Protocol) is the foundational suite of communication protocols used to interconnect network devices on the internet. The TCP/IP model consists of several layers, with the Internet Layer being responsible for addressing and routing packets between devices.

- **IP Address:** A unique identifier assigned to each device on a network. It allows devices to communicate with each other.
- **Subnet Mask:** This defines the range of IP addresses that can exist within a network. It helps distinguish the network part and the host part of an IP address.
- **Default Gateway:** The router or device that forwards traffic from a local network to other networks, including the internet.

Procedure:

Step 1: Open the Terminal

Open a terminal window on your Linux system.

Step 2: Identify Network Interfaces

Use the command below to list all available network interfaces:

```
ip addr
```

Identify your active network interface (e.g., eth0, ens33, wlan0).

Step 3: Configure Static IP Address

For Ubuntu/Debian:

1. Edit the netplan configuration file:

```
sudo nano /etc/netplan/01-netcfg.yaml
```

2. Modify or add the following configuration (replace placeholders):

```
network:
  version: 2
  ethernets:
    <interface>:
      dhcp4: no
      addresses:
        - <ip_address>/<subnet_mask>
      gateway4: <gateway>
      nameservers:
        addresses:
          - 8.8.8.8
          - 8.8.4.4
```

Step 4: Apply the Configuration

- **For Ubuntu/Debian:**

```
sudo netplan apply
```

Step 5: Verify the Configuration

1. Check the IP address:

```
ip addr
```

2. Check the routing table:

```
ip route
```

3. Test connectivity:

```
ping -c 4 8.8.8.8
```

Results

After following the steps, the static IP address, subnet mask, and default gateway should be configured correctly. The output of the `ip addr` and `ip route` commands should reflect the changes made. Successful replies from the `ping` command indicate that the configuration is working and that the machine can reach external networks.

Conclusion

The experiment successfully demonstrated how to configure TCP/IP settings on a Linux machine