How to Configure IP Address in Linux: A Step-by-Step Guide

Configuring an IP address is a fundamental task for network management and connectivity. In a Linux environment, this process is crucial for setting up servers, workstations, and other networked devices. This article will guide you through the steps to configure an IP address on a Linux system using both command-line tools and graphical interfaces. Understanding how to manage IP addresses in Linux can help ensure your network operates smoothly and efficiently.

Examples:

1. **Using ifconfig (deprecated but still widely used):**

   ```
   sudo ifconfig eth0 192.168.1.100 netmask 255.255.255.0 up
   ```

   This command assigns the IP address 192.168.1.100 with a subnet mask of 255.255.255.0 to the eth0 network interface and brings the interface up.

2. **Using ip command (recommended):**

   ```
   sudo ip addr add 192.168.1.100/24 dev eth0
   sudo ip link set dev eth0 up
   ```

   Here, 192.168.1.100/24 specifies the IP address and the subnet mask, and eth0 is the network interface.

3. **Configuring a static IP address via /etc/network/interfaces (Debian/Ubuntu):**

   Edit the file /etc/network/interfaces:

   ```
   sudo nano /etc/network/interfaces
   ```

   Add the following lines:

   ```
   auto eth0
   iface eth0 inet static
      address 192.168.1.100
      netmask 255.255.255.0
      gateway 192.168.1.1
   ```

Save and close the file, then restart the networking service:

```
sudo systemctl restart networking
```

4. **Configuring a static IP address via netplan (Ubuntu 18.04 and later):**

   Edit the netplan configuration file, usually located at /etc/netplan/01-netcfg.yaml:

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

   Add the following configuration:

   ```
   network:
    version: 2
    ethernets:
      eth0:
        dhcp4: no
        addresses: [192.168.1.100/24]
        gateway4: 192.168.1.1
        nameservers:
          addresses: [8.8.8.8, 8.8.4.4]
   ```

   Apply the configuration:

   ```
   sudo netplan apply
   ```

5. **Using nmcli (NetworkManager CLI):**

   ```
   sudo nmcli con add type ethernet ifname eth0 con-name static-
   eth0 ip4 192.168.1.100/24 gw4 192.168.1.1
   sudo nmcli con up static-eth0
   ```

   This creates a new connection named static-eth0 with the specified IP address and gateway, and then activates the connection.