

EXP NO: 2

Learning and Manual Assignment of IP Address to Computers

Aim

Manually assign a static IPv4 address, subnet mask, gateway, and DNS to a computer and verify network connectivity.

Materials / Tools

- Two PCs (or a PC + VM)
- Ethernet cables / virtual network adapter
- One switch/router (or host-only network in VM)
- Windows 10/11 or a Linux distribution (Ubuntu)
- Administrator / root access on the machines
- Terminal / Command Prompt / PowerShell
- Optional: Wireshark to observe traffic

Content

- **IP address (IPv4):** 32-bit identifier for a host (e.g., 192.168.1.10).
- **Subnet mask:** Defines network portion (e.g., 255.255.255.0 or /24).
- **Default gateway:** Router IP for traffic outside local subnet.
- **DNS:** Resolves domain names to IP addresses.
- **Static vs DHCP:** Static = manual config; DHCP = automatic config from server.
- **Why manual assignment:** Useful for servers, lab setups, predictable addressing, troubleshooting.

Procedure

A. Plan addressing (example)

- Host A: 192.168.10.10, Mask: 255.255.255.0 (/24), Gateway: 192.168.10.1, DNS: 8.8.8.8
- Host B: 192.168.10.11, Mask: 255.255.255.0, Gateway: 192.168.10.1, DNS: 8.8.4.4

B. Windows (GUI)

1. Open **Settings** → **Network & Internet** → **Ethernet** (or Control Panel → Network and Sharing Center → Change adapter settings).
2. Right-click the network adapter → **Properties**.
3. Select **Internet Protocol Version 4 (TCP/IPv4)** → **Properties**.
4. Choose **Use the following IP address** and fill:
 - o IP address: 192.168.10.10
 - o Subnet mask: 255.255.255.0
 - o Default gateway: 192.168.10.1
 - o Preferred DNS server: 8.8.8.8
5. Click **OK** → close. Wait a few seconds.

Expected Results

- `ipconfig / ip addr` shows the assigned static IP, mask, gateway, and DNS.
- `ping 192.168.10.1` — replies from gateway (latency in ms).
- `ping 192.168.10.11` — replies from the other host (if connected).
- `ping 8.8.8.8` — replies indicate external connectivity.
- `ping google.com` resolves and pings — confirms DNS works.
- `arp -a` will list MAC ↔ IP mappings on the local network.

Result

- Host successfully configured with static IPv4 address 192.168.10.10/24.
- Local connectivity to gateway (192.168.10.1) and peer host (192.168.10.11) verified.
- External connectivity verified by pinging 8.8.8.8 and `google.com` — DNS resolution successful.
- No packet loss observed; static addressing functioning as expected.