

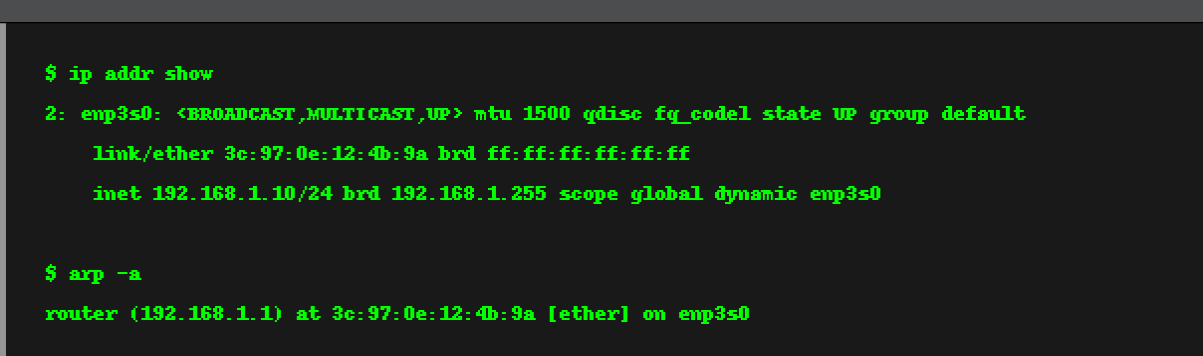
# Core Network Terms – NAT, ARP, MAC, IPv4, IPv6

## Methodology

I studied each network term separately, focusing on simple definitions, real-world examples, and practical commands. I referred to basic Linux commands like `ip addr show` and `arp -a` to see IP/MAC addresses and ARP tables.

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## Screenshots



```
$ ip addr show
2: enp3s0: <BROADCAST,MULTICAST,UP> mtu 1500 qdisc fq_codel state UP group default
    link/ether 3c:97:0e:12:4b:9a brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.10/24 brd 192.168.1.255 scope global dynamic enp3s0

$ arp -a
router (192.168.1.1) at 3c:97:0e:12:4b:9a [ether] on enp3s0
```

## Findings

- NAT translates private IPs to public IPs.
  - ARP resolves IP to MAC in local networks.
  - MAC is a unique hardware ID for devices.
  - IPv4 uses 32-bit addresses (limited).
  - IPv6 uses 128-bit addresses (huge space, better security).
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## Conclusions

These five terms are fundamental to networking. Understanding them helps in troubleshooting, ethical hacking, and security testing. IPv6 will reduce NAT dependency in the future.

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## Code/Commands

```
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ip addr show      # View IP and MAC
arp -a            # View ARP table
ping google.com   # Test NAT in action
```