# Networking

What is a computer network

A computer network comprises two or more computers that are connected—either by cables (wired) or WiFi (wireless)

Network bazz ...
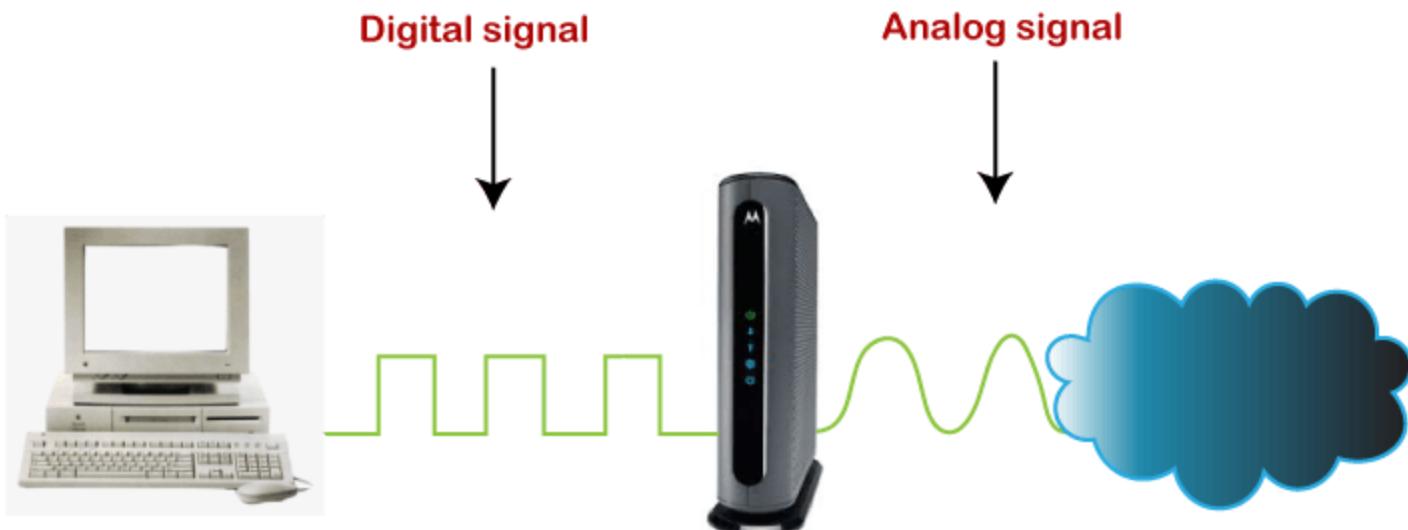
- LAN
- WAN
- Switch
- Router
- Modem
- ip address
- gateway
- DNS
- DHCP
- services

LAN / WAN
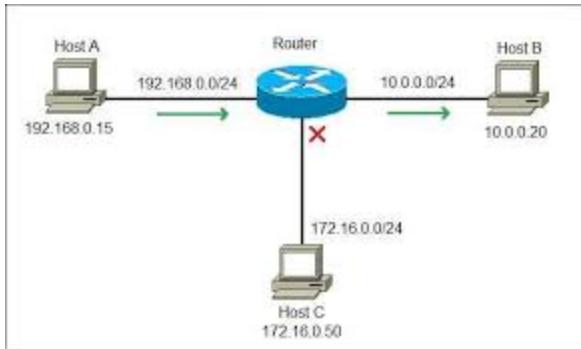
Modem / Router / Switch

- Convert to

Digital signal

Analog signal
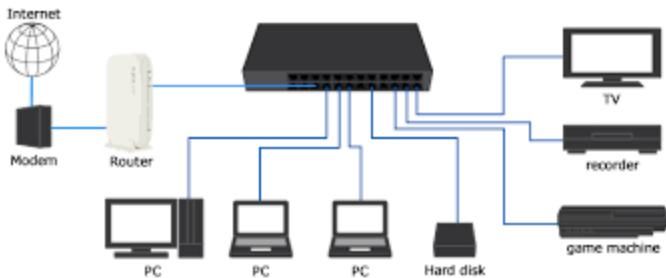
Router

wikipedia: A router is a networking device that forwards data packets between computer networks.
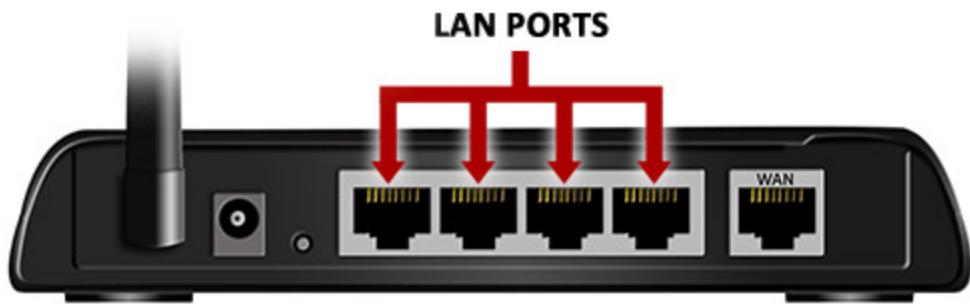
- NAT

- Gateway

Switch

wikipedia: A switch is a device in a computer network that connects other devices together.
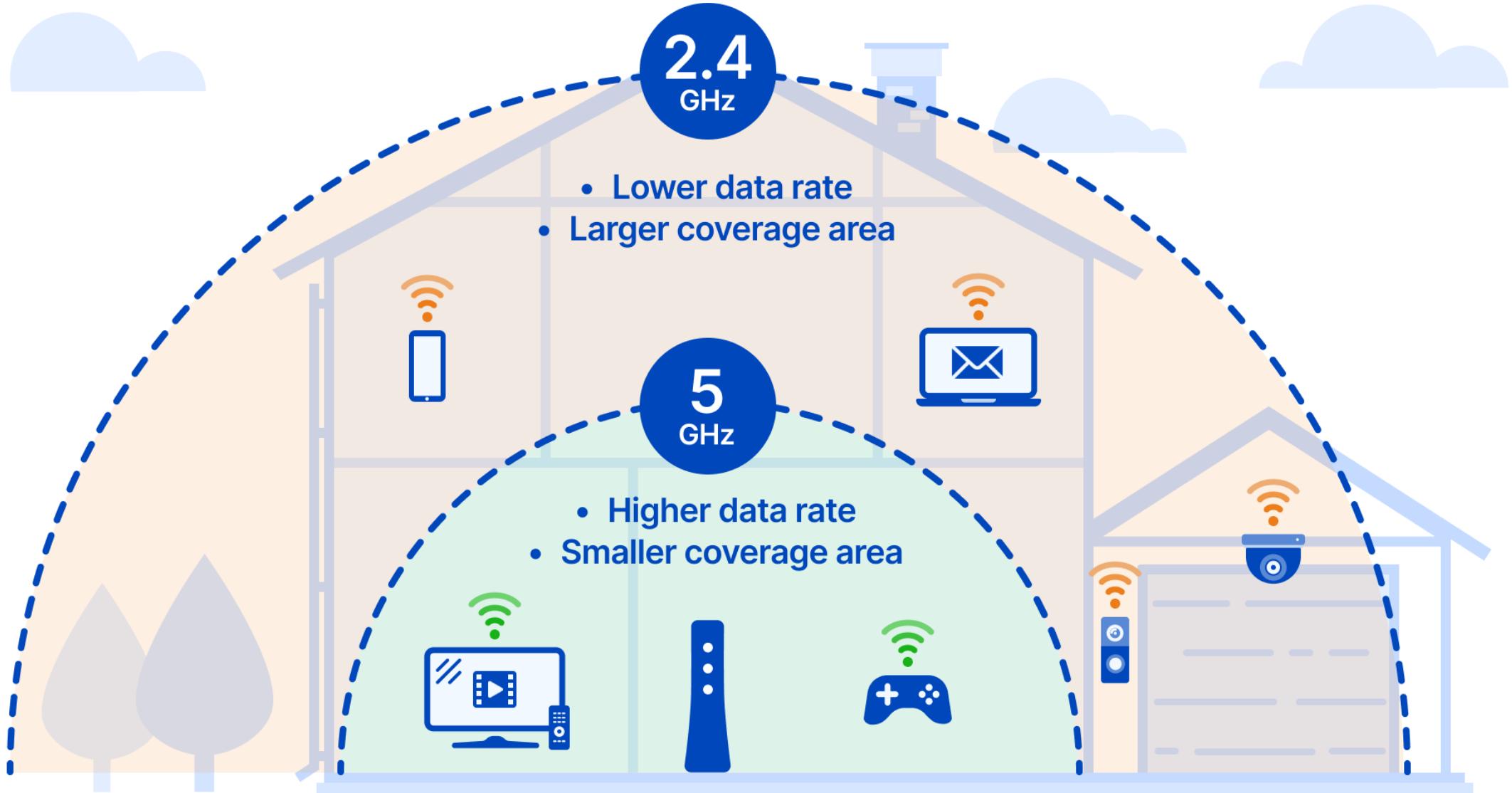
All in one

Surf the Net at Maximum Speeds

Type	Transmission rate	Frequency bandwidth	Distance	Standard
Cat.8	40Gbps	2000MHz	30m	SSTP
Cat.7	10Gbps	600MHz	100m	SSTP
Cat.6A	10Gbps	500MHz	100m	STP/UTP
Cat.6	1000Mbps	250MHz	100m	STP/UTP
Cat.5e	1000Mbps	155MHz	100m	STP/UTP
Cat.5	100Mbps	100MHz	100m	STP/UTP

WIFI

2.4 GHz
- Lower data rate
- Larger coverage area

5 GHz
- Higher data rate
- Smaller coverage area

Network commands

- ping

- ifconfig

Ping

- ICMP(8) - The Internet Control Message Protocol (ICMP) is a network layer protocol used by network devices to diagnose network communication issues.

Ping: command uses ICMP to send a packet to a remote host and wait for a response. This can be used to test the connectivity between two hosts and to measure the round-trip time (RTT) of a packet.

```
ping 8.8.8.8
```
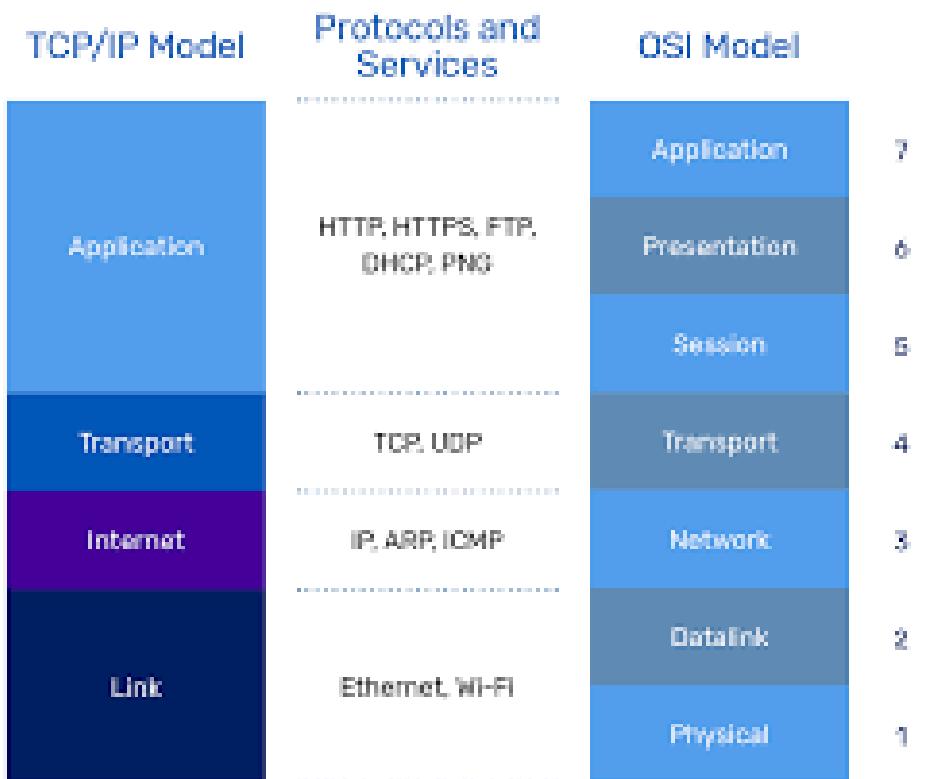
ifconfig

ifconfig is a system administration utility in Unix-like operating systems for network interface configuration.

```
lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)

wlo1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.100.102.16  netmask 255.255.255.0  broadcast 10.100.102.255
        inet6 fe80::493f:baf7:5f6a:1d4c  prefixlen 64  scopeid 0x20<link>
        ether f4:4e:e3:a1:cc:c3  txqueuelen 1000  (Ethernet)
```

Models

TCP/IP Model	Protocols and Services	OSI Model	
Application	HTTP, HTTPS, FTP, DHCP, PNG	Application	7
		Presentation	6
		Session	5
Transport	TCP, UDP	Transport	4
Internet	IP, ARP, ICMP	Network	3
Link	Ethernet, Wi-Fi	Datalink	2
		Physical	1

DHCP
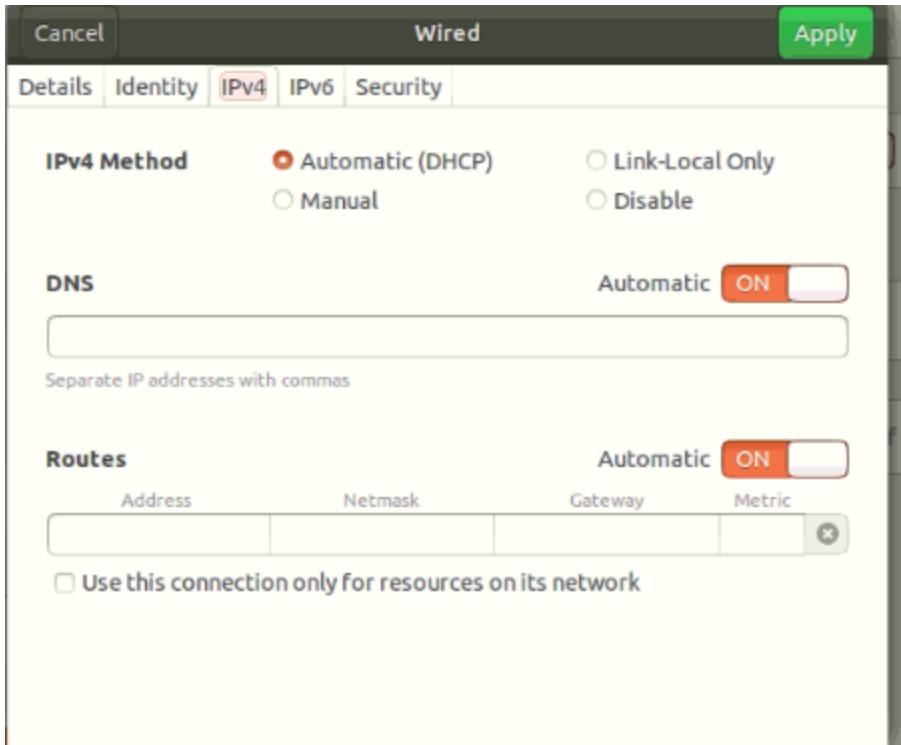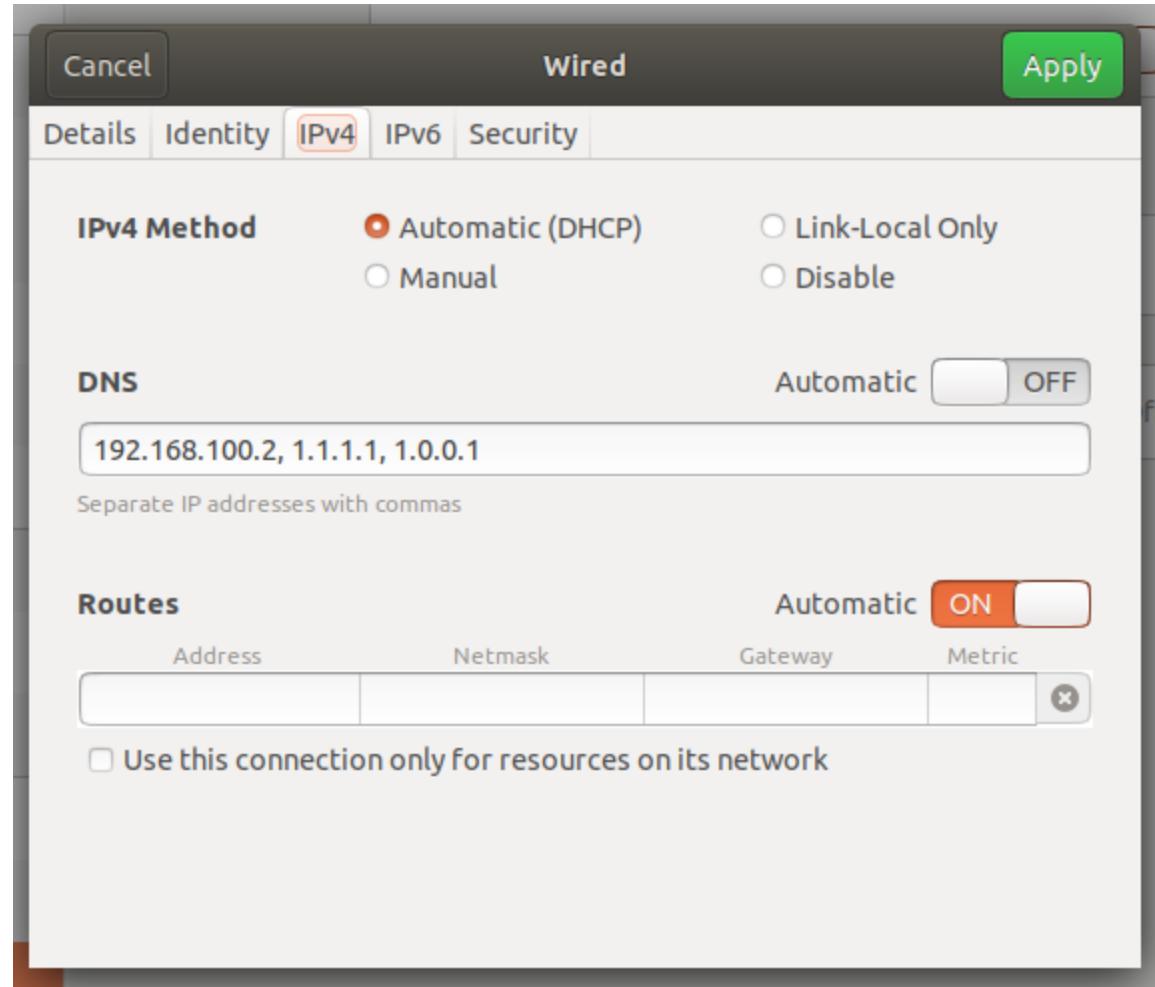
DNS

Service

Network service is an application called `server` that has service base on protocols

- Web

- Email

- zoom

-

Protocol

Network protocols are a set of rules outlining how connected devices communicate across a network to exchange information.

- HTTP
- DHCP
- DNS