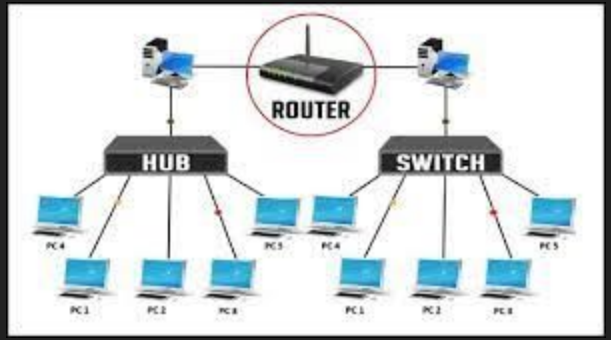
Hubs, Switches, Modems and Routers

What’s the difference between them?

Hubs, Switches, Modems, and Routers serve different networking purposes.



Hub

Simple device

With several to many ports for ethernet cables

Simply passes any data packets through to all of its ports

Data goes into port 1 and back out all other ports

No filtering involved.

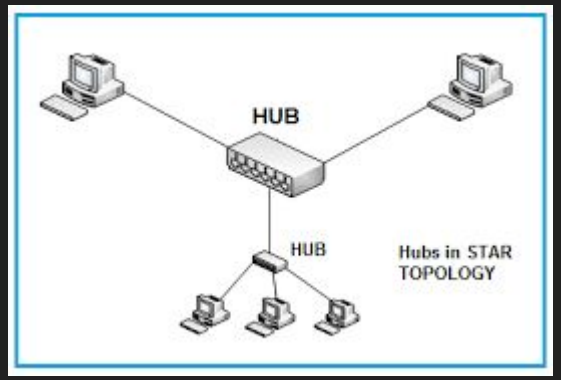
Therefore not efficient.

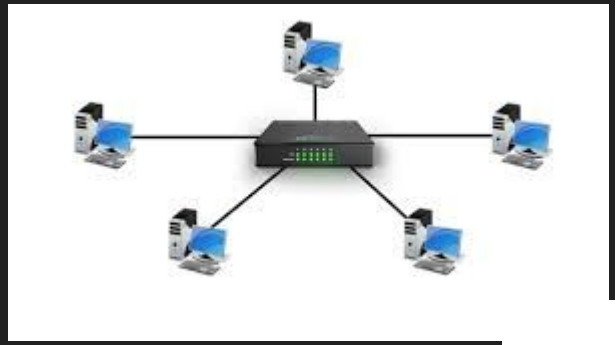
Slows down network.

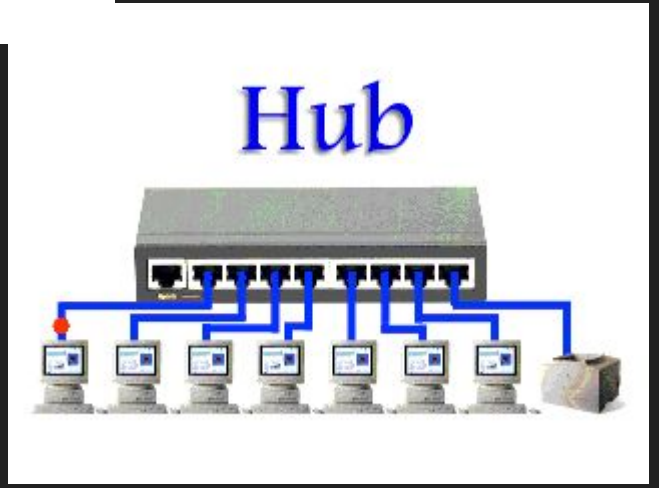
Data is broadcastedi.e. sent everywhere

Low security.

Hub Examples







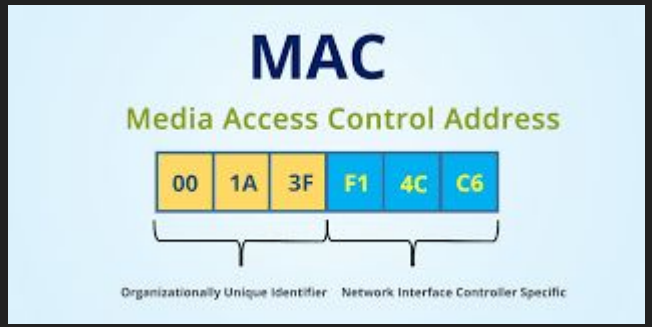
Switch

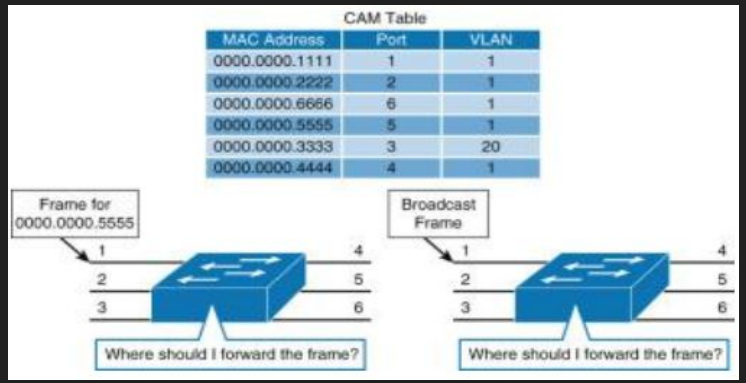
Looks like hubs

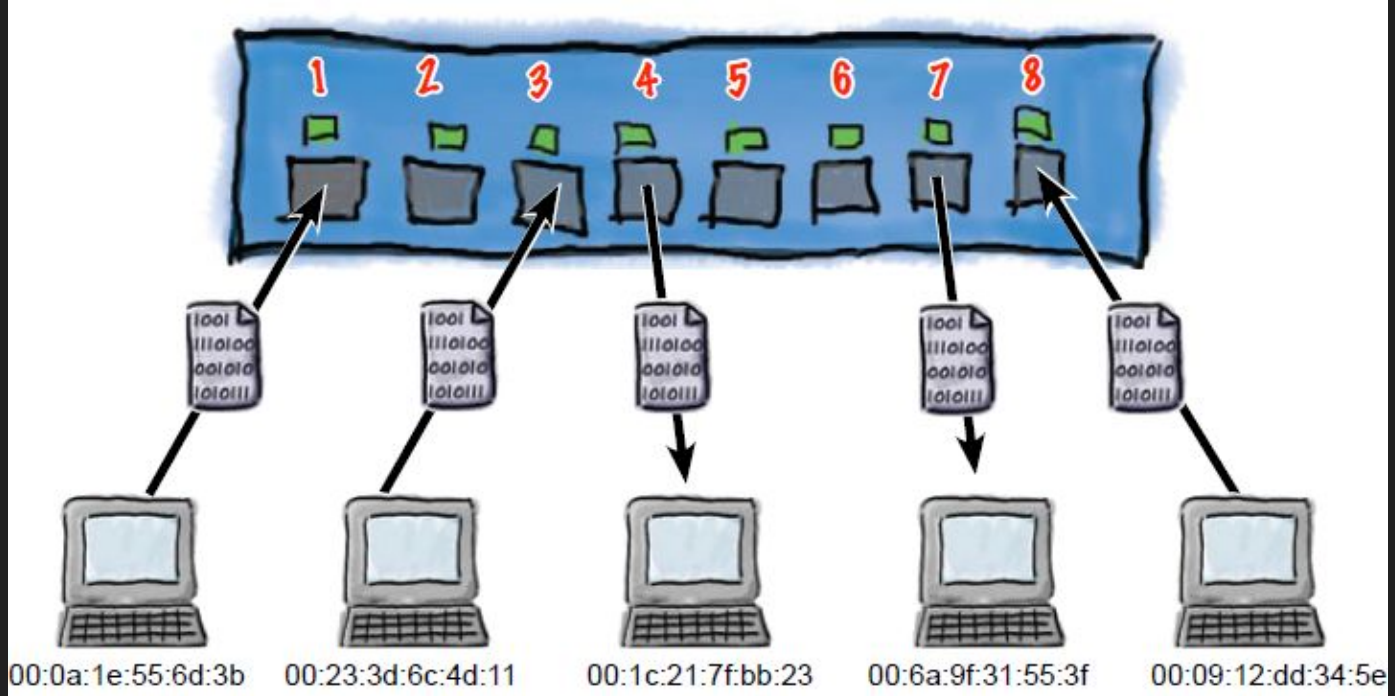
More intelligent.

Stores the MAC addresses of all devices connected to it.

It knows which port matches with which MAC address and only sends data packet (data packets contain both source and destination MAC dresses) there.







MAC address	Port
00:0a:1e:55:6d:3b	1
00:23:3d:6c:4d:11	3
00:1c:21:7f:bb:23	4
00:6a:9f:31:55:3f	7
00:09:12:dd:34:5e	8

Comparison

HUB

Only detects that a device is physically connected to it.

SWITCH

Can detect specific devices that are connected to it.

Keeps a record of the MAC addresses of those devices.

Hubs and Switches

Used only in local networks.

Not used to connect different networks i.e. large business with multiple segmented subnetworks and the internet.

Do not understand IP addresses.

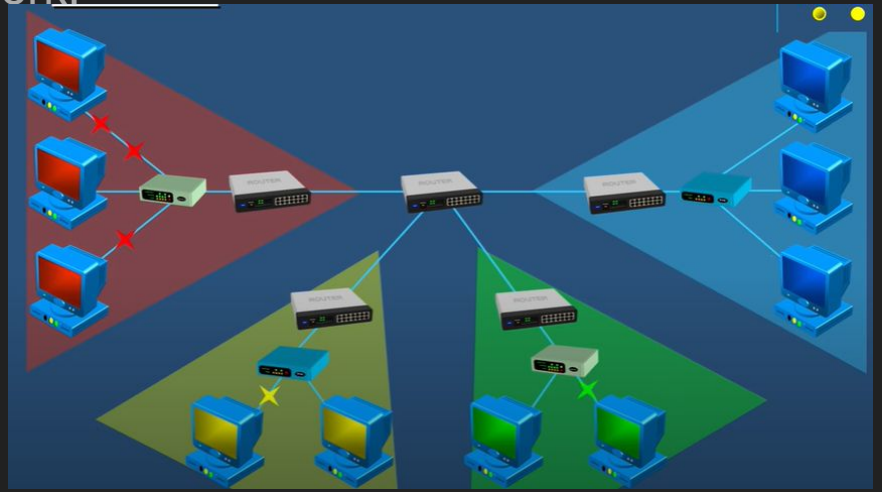
Routers are designed to understand how to work with IP addresses.

Routers

Forwards data based on the IP address.

Based on the IP address a router can determine if the data packet is meant to be sent to another network or to stay in its own.

Often referred to as the gateway to a network.



Modem

Modulator-Demodulator

It does this by connecting to an ISP (Internet Service Provider).

Modems convert(demodulate) the incoming analog signals from the internet into digital signals.

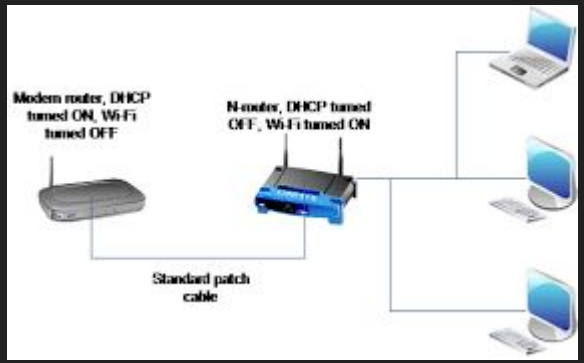
It also converts(modulate) the digital signals in the home/business network back to analog for entry back into the internet.

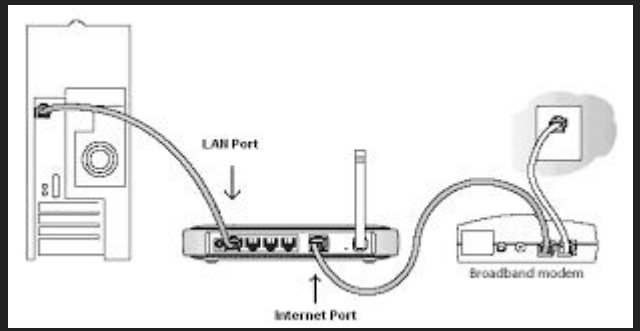
Routers

Routers are found behind the modem.

‘There are many types 1. Business 2. Small office/home.

Routers route data packets to the different devices connected to your home network.





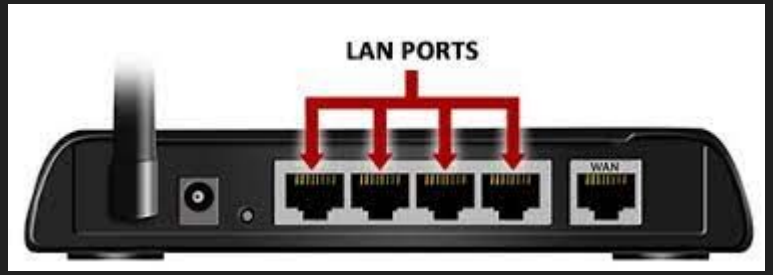
Router Ports

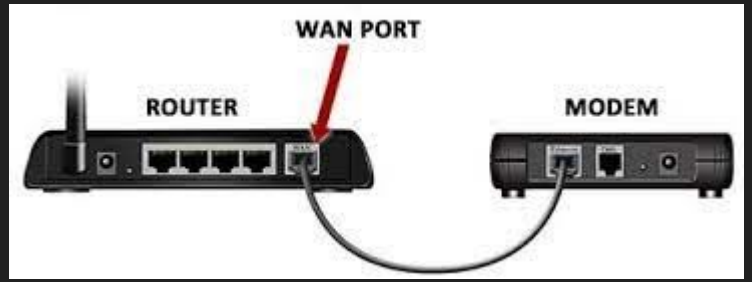
Routers have ports.

You connect ethernet cables to these ports,

The WAN port normally connects to the internet

The others(LAN ports) connect to computers or other ethernet capable devices i.e. storage device, printer etc.





Wireless Access Point

WAP-router can also act as wireless access points whereby the devices that have wifi capability can connect to it wirelessly

Modem Types

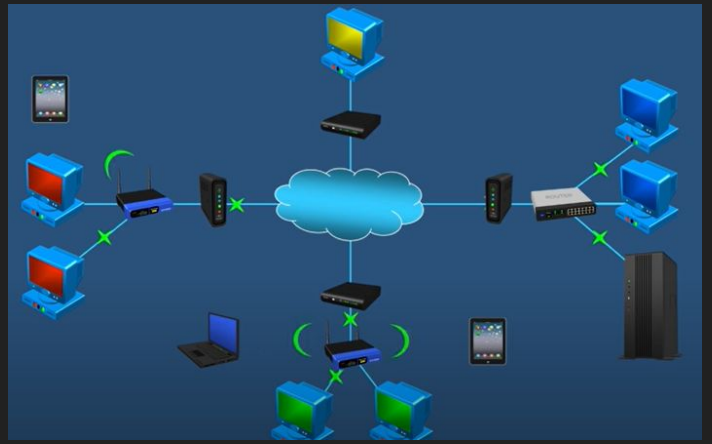
Cable-connected via coaxial cable, provided by Rogers and other TV companies

DSL -connected via telephone and services by phone companies i.e. Bell

Modem and Router in One

Most companies will send you a modem-router that has both devices built into one.

Mini Internet Example



How many networks?

2

Which network uses a router and

modem in one device? Why?

One network uses a router and modem in one device for simplicity and cost efficiency.

Which is the business network? Why?

The business network due to more devices and structured connections.

Which network uses wifi to connect

their network devices? Why?

The home network uses Wi-Fi to connect devices for wireless convenience.