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1. Router

a. Router and its basics

A router is a small physical device that connects multiple networks together. It is that device that connects all your computer to one another, either through Ethernet cables or wireless connection. You may think that what is the difference between a router and modem which we still mostly use in rural area to access Internet. Your modem connects you to the internet where as a router helps to connect you computer to one another. When you hook up your router with modem then you can share internet to all the computer in the network. Sometime modem comes with built in router.

Those devices that you connect to your router are called clients which may include computer, laptop, tablet, smartphone and many more. Each client in the network is give a IP(Internet Protocol) which helps your router to direct traffic. In a simple way you can understand router as you connect internet to the router and it distributes it among the other computer in the network.

b. Types of routers

There are two types of router generally. They are wired and wireless. Their name itself describes their properties. Home network generally use wired or wireless routers. We use CAT cable to connet any deveices to another device. Most people prefer wireless router because wireless router provides facility of both wired and wireless connection. You can wire up when in need and use wireless everywhere else.

c. Throughput and Range

These are some vast topic but if you understand them its meaning is nearly same that you use in you daily life. When you buy a motorbike you always ask how much maximum mileage does this bike give. Throughput meaning is

nearly same. Throughput is the speed at which a router can transfer data. The speed depends upon whether it is wired or wireless.

Range of the router is that area over which your router is accessible. This comes when you are using wireless connection. If you have a big house and have router on one side then you might not be able to access the router on the other side. Your range is determined by the standard you use.

d. Ports
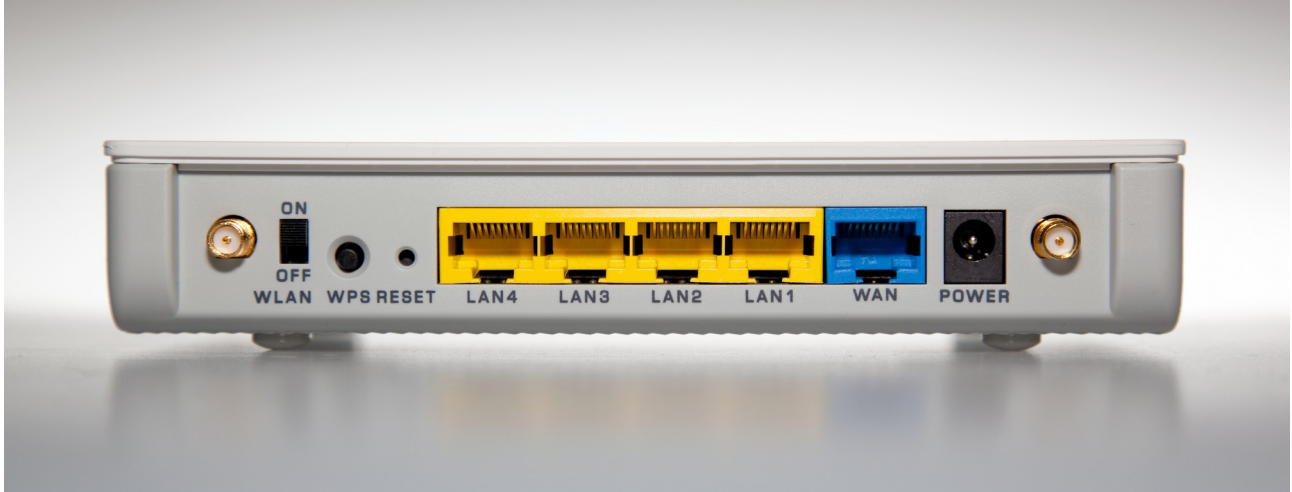
Router generally have two kinds of port. They are situated at the back of the router. They are LAN and WAN ports where WAN port get connected to the intenet whereas your LAN port hooks up with the computers and other clients. Most router have one WAN ports and its LAN port depends upon the router you are using.Its better you get the router with as many ports as possible. If you have more wired devices that can fit into your router then you can connect them into a switch. A switch is just like a power strip to your router. It can let you connect more wired devices than the router was originally designed .
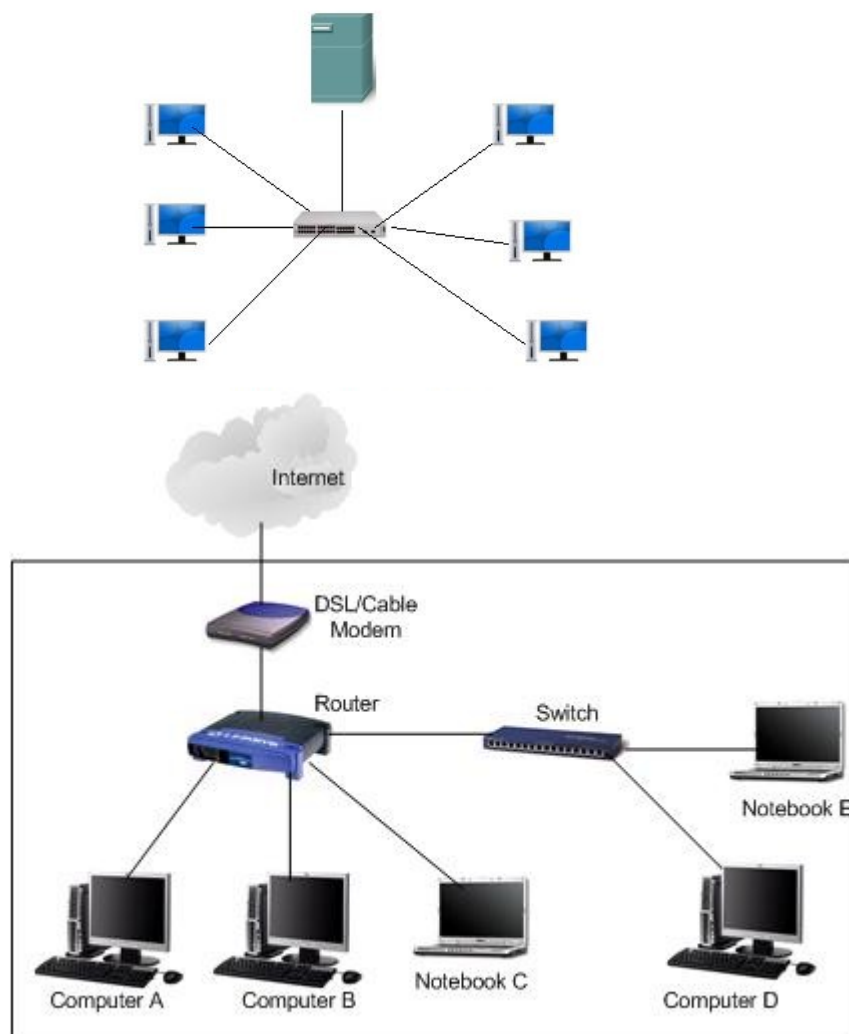
2. Switch

a. Fundamental

A switch is a small hardware device that joins multiple computer together within one LAN(Local Area Network). Ethernet switch devices were commonly used on home networks before home router became popular. Network switches helps computer or user to get connected with printer or other computers in the network. They allow smooth data packet transfer to other device at a very high speed. Becuse of it's usefullness it can be found in everywhere like home, office ,schools etc.

b. Working mechanism

Actually switches are the fundamental and essential part of any computer network. The switches in the network make it possible for multiple devices like computer and other devices to communicate with each other using Ethernet on LAN(Local Area Network). The switches also share an incoming wired or wireless Internet connection with all the devices attached through a designated computer.Network switches look like boxes with ports at its back and front end. The number of the ports available usually depends on the switch model and design. Four to eight port are common in switches.

c. Switch in a network

A switch in a network acts as a hardware device that filters and forwards packets through the network.

There are some examples how switch are used in the network. In the first figure it is shown that how switch are connected in LAN. The second figure also shows much clearer view of entire network. Switches allow you to send information, such as email, and access shared resources, including printers, in a smooth, efficient, and transparent manner.

d. Switch vs Hub

In the most basic networks, devices are connected to hubs. There's a limit to the amount of bandwidth user can share over hub based networks. The amount of time data takes to get to its destination increases on hub networks as more devices are added. A switch avoids these and other limitations of hub networks.

e. Switch vs Routers

Just like switches allows different devices on the network to communicate router allows different network to communicate. A router also connects network computer to the internet, allowing multiple user to share a connection. A router acts as a dispatcher. A router can also be used like a switch if needed. Routers might have a single WAN port and a single LAN port and are designed to connect an existing LAN or switch to a WAN. Switches can be connected to a router with multiple PC ports to expand a LAN.