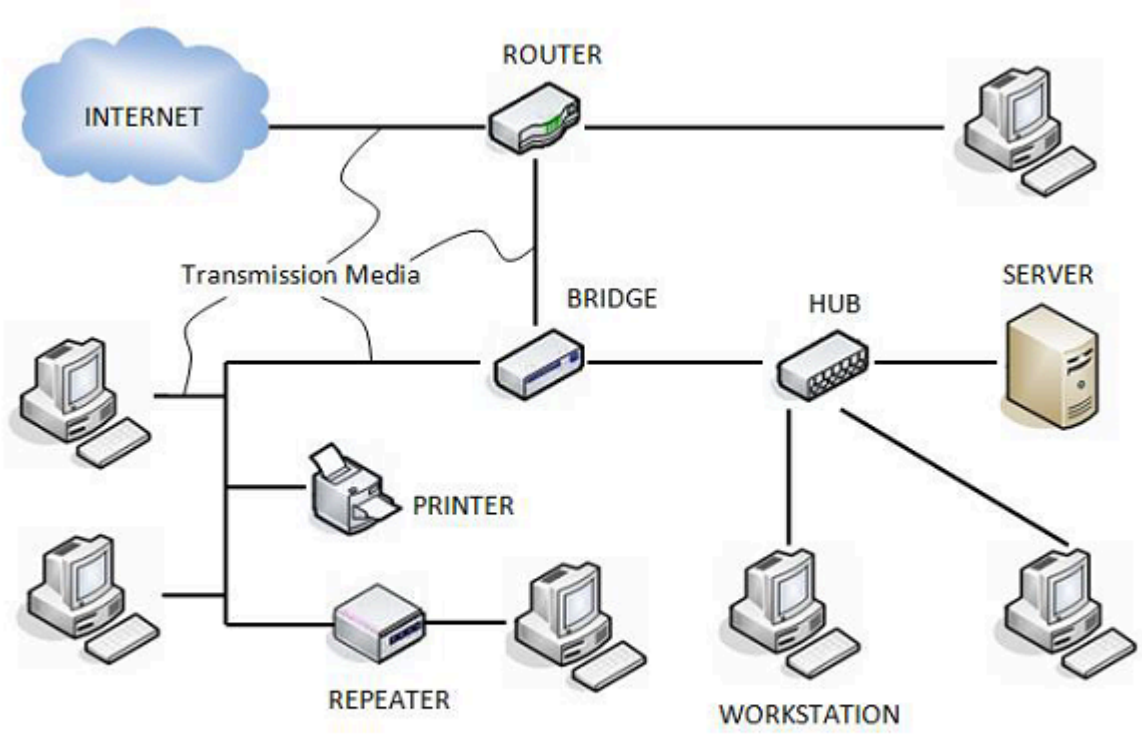
Computer Network Components

Computer networks components comprise both physical parts as well as the software, for installing computer networks, both at organizations and at home. The hardware components are the server, client, peer, transmission medium, and connecting devices. The software components are operating system and protocols.

Computer Network Componenets

The following figure shows a network along with its components –



COMPUTER NETWORK COMPONENTS

Computer Network Hardware Components

Hardware components is said to the physical parts of a computer or electronic system, which work together to perform various tasks. Here are the following various hardware componenets given as follows.

- **Servers** –Servers are high-configuration computers that manage the resources of the network. The network operating system is typically installed in the server and so they give user accesses to the network resources. Servers can be of various kinds: file servers, database servers, print servers etc.

- **Clients** – Clients are computers that request and receive service from the servers to access and use the network resources.
- **Peers** – Peers are computers that provide as well as receive services from other peers in a workgroup network.
- **Transmission Media** – Transmission media are the channels through which data is transferred from one device to another in a network. Transmission media may be guided media like coaxial cable, fibre optic cables etc; or maybe unguided media like microwaves, infra-red waves etc.
- **Connecting Devices** – Connecting devices act as middleware between networks or computers, by binding the network media together. Some of the common connecting devices are: Routers, Bridges, Hubs, Repeaters, Gateways and Switches.

Connecting devices

Connecting devices provides an intermediaries for communication between different networks or computers by linking various devices, this helps to travel data across multiple systems and nework efficiently. Here we will see the following examples in details.

Hubs

It's a basic device, which connects multiple devices in a network. It operates on the physical layer of the OSI model and broadcasts data to all connected devices.

Switches

It's a more advanced version of the hub, which intelligently directs data packets to the specific device improving network efficiency. It reduces network collisions compared to hubs and is commonly used in modern local area networks (LANs).

Router

It's a device, that routes data packets between different networks like between LAN and the internet, this operates on the network layer of the OSI model and can also assign IP addresses, due to which it is capable of performing extra functions like security filtering and quality of service (QoS).

Gateway

This device connects two different networks, of different protocols or architectures. This operates at various layers of the OSI model and can perform complex translations.

Repeaters

This device is used to amplify or regenerate signals. This is often used in situations where the signal strength degrades over long distances, such as in large area networks or across long cables.

Computer Network Software Components

- **Networking Operating System** – Network Operating Systems is typically installed in the server and facilitate workstations in a network to share files, database, applications, printers etc.
- **Protocol Suite** – A protocol is a rule or guideline followed by each computer for data communication. Protocol suite is a set of related protocols that are laid down for computer networks. The two popular protocol suites are –
    - a. OSI Model (Open System Interconnections)
    - b. TCP / IP Model