Merits of OSI reference model:

- OSI model distinguishes well between the services, interfaces and protocols.
- Protocols of OSI model are very well hidden.
- Protocols can be replaced by new protocols as technology changes.
- Supports connection oriented services as well as connectionless service.

Demerits of OSI reference model:

- Model was devised before the invention of protocols.
- Fitting of protocols is tedious task.
- It is just used as a reference model.

Internetworking

Internetworking started as a way to connect disparate types of computer networking technology. Computer network term is used to describe two or more computers that are linked to each other. When two or more computer networks or computer network segments are connected using devices such as a router then it is called as computer internetworking.

Internetworking is a term used by Cisco. Any interconnection among or between public, private, commercial, industrial, or governmental computer networks may also be defined as an internetwork or Internetworking.

Internetworking in detail

In modern practice, the interconnected computer networks or Internetworking use the Internet Protocol. Two architectural models are commonly used to describe the protocols and methods used in internetworking. The standard reference model for internetworking is Open Systems Interconnection (OSI). Internetworking is implemented in Layer 3 (Network Layer) of this model the most notable example of internetworking is the Internet (capitalized). There are three variants of internetwork or Internetworking, depending on who administers and who participates in them:

- Extranet
- Intranet
- Internet

Extranet: An extranet is a network of internetwork or Internetworking that is limited in scope to a single organization or entity but which also has limited connections to the networks of one or more other usually, but not necessarily, trusted organizations or entities. Technically, an extranet may also be categorized as a MAN, WAN, or other type of network, although, by definition, an extranet cannot consist of a single LAN; it must have at least one connection with an external network.

Intranet: An intranet is a set of interconnected networks or Internetworking, using the Internet Protocol and uses IP-based tools such as web browsers and ftp tools, that is under the control of a single administrative entity. That administrative entity closes the intranet to the rest of the world, and allows only specific users. Most commonly, an intranet is the internal network of a company or other enterprise. A large intranet will typically have its own web server to provide users with browsable information.

Internet: A specific Internetworking, consisting of a worldwide interconnection of governmental, academic, public

+3., and private networks based upon the Advanced Research Projects Agency Network (ARPANET) developed by ARPA of the U.S. Department of Defense also home to the World Wide Web (WWW) and referred to as the 'Internet' with a capital 'I' to distinguish it from other generic internetworks. Participants in the Internet, or their service providers, use IP Addresses obtained from address registries that control assignments.

Different type of networking devices:

Network Hub:

Network Hub is a networking device which is used to connect multiple network hosts. A network hub is also used to do data transfer. The data is transferred in terms of packets on a computer network. So when a host sends a data packet to a network hub, the hub copies the data packet to all of its ports connected to. Like this, all the ports know about the data and the port for whom the packet is intended, claims the packet.

However, because of its working mechanism, a hub is not so secure and safe. Moreover, copying the data packets on all the interfaces or ports makes it slower and more congested which led to the use of network switch.

HUB

Modem

Switch

Network Switch: -Like a hub, a switch also works at the layer of LAN (Local Area Network) but you can say that a switch is more intelligent than a hub. While hub just does the work of data forwarding, a switch does 'filter and forwarding' which is a more intelligent way of dealing with the data packets.

So, when a packet is received at one of the interfaces of the switch, it filters the packet and sends only to the interface of the intended receiver. For this purpose, a switch also maintains a CAM (Content Addressable Memory) table and has its own system configuration and memory. CAM table is also called as forwarding table or forwarding information base (FIB).

Modem:

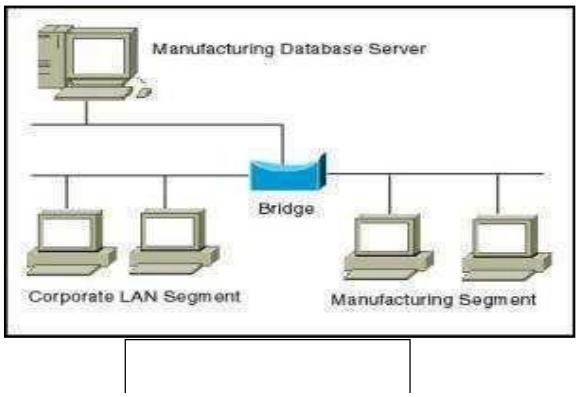
A modem stands for (Modulator+Demodulator). That means it modulates and demodulates the signal between the digital data of a computer and the analogue signal of a telephone line.

A Modem is somewhat a more interesting network device in our daily life. So, if you have noticed around, you get an internet connection through a wire (there are different types of wires) to your house. This wire is used to carry our internet data outside to the internet world. However, our computer generates binary data or digital data in forms of 1s and Os and on the other hand, a wire carries an analog signal and that's where a modem comes in.

Network Router:

A router is a network device which is responsible for routing traffic from one to another network. These two networks could be a private company network to a public network. You can think of a router as a traffic police who directs different network traffic to different directions.

1WIFI Router



Bridge:

If a router connects two different types of networks, then a bridge connects two subnetworks as a part of the same network. You can think of two different labs or two different floors connected by a bridge.

Repeater:

A repeater is an electronic device that amplifies the signal it receives. In other terms, you can think of repeater as a device which receives a signal and retransmits it at a higher level or higher power so that the signal can cover longer distances.

For example, inside a college campus, the hostels might be far away from the main college where the ISP line comes in. If the college authority wants to pull a wire in between the hostels and main campus, they will have to use repeaters if the distance is much because different types of cables have limitations in terms of the distances they can carry the data for.