3. Networks & Internet:

When a numbers of computers are connected together, they form a *computer network.*

Networks according to size:

- ***Personal Area Network (PAN):*** consists of two to five computing devices. This found in the home, and may be based on wireless technology like Bluetooth.

- ***Local Area Network (LAN):*** the most common type of network. It consists of from about four up to as many as a couple of hundred of computers linked together with one set of cables, usually within the same building. Most LANs are controlled by a central *fileserver* that takes care of network communications, security control and the storage of data files. A student computer laboratory typically constitutes one LAN.

- ***Metropolitan Area Network (MAN):*** a network infrastructure linking various local businesses within a large city area. This is now almost completely superseded by the Internet.

- ***Wide Area Network (WAN):*** the opposite of the LAN. It links computers over large geographical areas. This network usually makes use of the public telecommunications network.

Network Topologies:

The network *topology* refers to the physical and logical way in which the computers in a network are connected together.

- **The *star* network** is driven by one central computer to and through which all other computers communicate. Although this allows for central co-ordination and control, it requires a very reliable central computer and lots of cables.

- **The *ring* network** consists of a continuous loop connecting all computers. Signals travel in a given direction and all computers have equal access to the data.

- **The *bus* network** is currently the most popular configuration. A central data cable is used, to which each computer (and other devices such as printers and routers) can be attached. Devices can be added or removed without affecting the rest of the network.

Network Devices:

1. ***Network cables*** are the physical wires by which computers are linked together. The most common types are: *Twisted pair, Coaxial cable, fiber-optic. But* not all computer devices need a physical cable connection. Because of the cabling costs, engineers have explored many methods of transmitting data without the use of wires this called Wireless.

2. **Network interface cards (NICs)** are necessary when computers are connected directly to other computers by means of digital network cables. Their primary function is to make sure that there is no transmission conflicts with the other computers linked to the network. In addition, the network card usually fulfills an error-checking function, to ensure that uncorrupted data is received at its destination.

3. ***Multiplexers*** allow a single channel to carry data transmissions from many sources, by merging them at one end of the channel and then separating the individual transmissions at the receiving end of the channel.

4. ***Routers*** A hardware device designed to take incoming packets, analyzing the packets and then directing them to the appropriate locations.

5. ***Modem*** allows a computer to communicate with another computer by means of the public voice telephone network, rather than by using digital cabling. This requires the conversion of digital computer signals into analogue sound signals this process is called *modulation*. At the other end of the line, these sound signals are converted back into digital

signals – or *demodulated*. The word *modem* refers to this modulation / demodulation process.

What is the Internet?

The origins of the Internet can be found in the early sixties, when the US Department of Defense sponsored a project to develop a telecommunications network that would survive a nuclear attack. It had to link together a diverse set of computers and work in a decentralized manner so that, if any part of the network were not functioning, network traffic would automatically be re-routed via other network nodes. This project quickly grew into a popular academic network linking virtually all major research institutions and US universities. Thus linking academics and researchers across the globe, it quickly became a means for global information sharing.

The *Internet* consists of a huge and fast-growing number (hundreds of thousands) of *inter*connected *net*works linked together.

The Web

The Internet service that has received the most attention from the public media is the *World-Wide Web* or *the Web* for short (sometimes also called *WWW* or *W3*). The Web is a collection of multimedia information located on Web servers attached to the Internet.