20 Networks

A LANs (Local Area Networks)

Networking allows two or more computer systems to exchange information and share resources and peripherals.

LANs are usually placed in the same building. They can be built with two main types of architecture: **peer-to-peer**, where the two computers have the same capabilities, or **client-server**, where one computer acts as the **server** containing the main hard disk and controlling the other **workstations** or **nodes**, all the devices linked in the network (e.g. printers, computers, etc.).

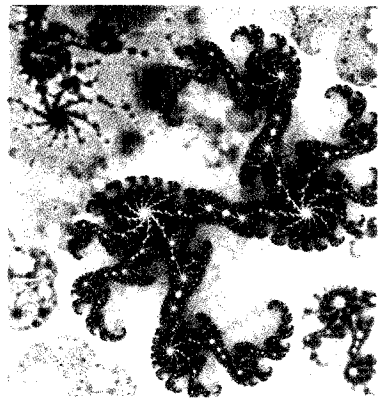
Computers in a LAN need to use the same **protocol**, or standard of communication. Ethernet is one of the most common protocols for LANs.

A **router**, a device that forwards data packets, is needed to link a LAN to another network, e.g. to the Net.

Most networks are linked with cables or wires but new **Wi-Fi**, **wireless fidelity**, technologies allow the creation of **WLANs**, where cables or wires are replaced by radio waves.

To build a WLAN you need **access points**, radio-based receiver-transmitters that are connected to the wired LAN, and **wireless adapters** installed in your computer to link it to the network.

Hotspots are WLANs available for public use in places like airports and hotels, but sometimes the service is also available outdoors (e.g. university campuses, squares, etc.).



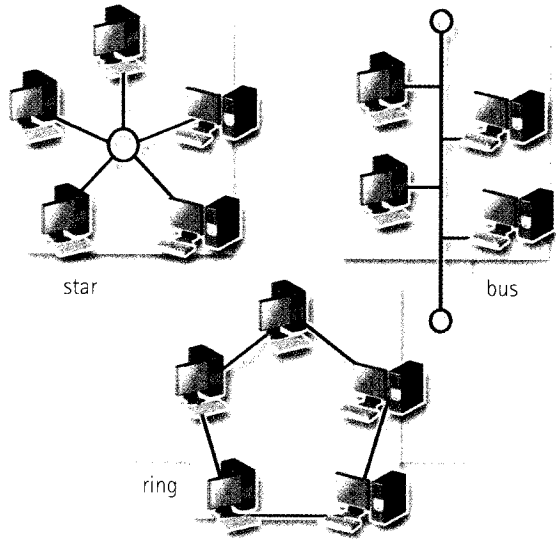
Networks

B Network topology

Topology refers to the shape of a network. There are three basic physical topologies.

- **Star**: there is a central device to which all the workstations are directly connected. This central position can be occupied by a server, or a **hub**, a connection point of the elements of a network that redistributes the data.
- **Bus**: every workstation is connected to a main cable called a bus.
- **Ring**: the workstations are connected to one another in a closed loop configuration.

There are also mixed topologies like the **tree**, a group of stars connected to a central bus.



The three basic network topologies

C WANs (Wide Area Networks)

WANs have no geographical limit and may connect computers or LANs on opposite sides of the world. They are usually linked through telephone lines, fibre-optic cables or satellites. The main transmission paths within a WAN are high-speed lines called **backbones**.

Wireless WANs use mobile telephone networks.

The largest WAN in existence is the Internet.