Knowledge Organiser: Networks *Explore how data travels the world*

Summary

A **network** is created when more than one device is connected together.

A network can be a small collection of computers connected within a building (e.g. a school, business or home) or it can be a wide collection of computers connected around the world.

The main purpose of networking is to share data between computers.

A file has to be broken up into small chunks of data known as **data packets** in order to be transmitted over a network. The data is then re-built once it reaches the destination computer.

Protocols are used to control how data is transmitted across networks. They are a set of rules for how messages are turned into data packets and sent across networks.

Bandwidth measures the amount of data that can transfer through a communications channel over a given period of time.

Key Vocabulary

File server	A networked **computer** that provides shared storage, it can be accessed by workstations on the same network.
Input device	Input devices, like a keyboard, allow us to put raw data in a computer which it processes to produce outputs.
LAN	**L**ocal **A**rea **N**etwork covers a small area such as one site or building, e.g. a school or a college.
Licence	A legal agreement between the company who published the software and the end user covering areas such as copyright.
Network	A network is a number of computers linked to-gether to allow the sharing of resources.
Output device	A device used to output data or information from a computer, e.g. a monitor or printer.
Server	A computer that holds data to be shared with other computers. A web server stores and shares websites.
WAN	**W**ide **A**rea **N**etwork covers a large geographical area. Most WANs are made from several LANs connected together.
Workstation	A computer connected to a network.

LANs and WANs

A school network is usually a **LAN**. LANs are often connected to WANs, for example a school network could be connected to the internet. **WAN**s can be connected together using the internet, leased lines or satellite links.
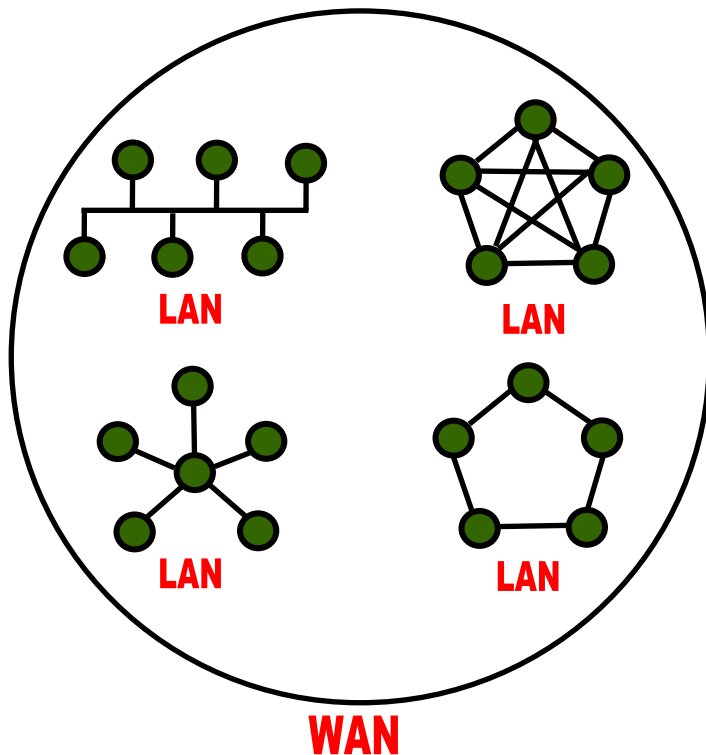
Advantages of networks

- ♦ Sharing devices such as printers saves money.
- ♦ Site (software) licences are likely to be cheaper than buying several standalone licences.
- ♦ Files can easily be shared between users.
- ♦ Network users can communicate by email and instant messenger.
- ♦ Security is good - users cannot see other users' files unlike on stand-alone machines.
- ♦ Data is easy to backup as all the data is stored on the file server.

Disadvantages of networks

- ♦ Purchasing the network cabling and file servers can be expensive.
- ♦ Managing a large network is complicated, requires training and a network manager usually needs to be employed.
- ♦ If the file server breaks down the files on the file server become inaccessible. Email might still work if it is on a separate server. The computers can still be used but are isolated.
- ♦ Viruses can spread to other computers throughout a computer network.
- ♦ There is a danger of hacking, particularly with wide area networks. Security procedures are needed to prevent such abuse, e.g. a firewall.

Topologies

Bus

Mesh

Star

Ring