Week 52 - Wired Networks

11th October 2020 at 9:48pm

Contents

We are learning today:

- about different types of wired networks
- how they are used
- comparing advantages and disadvantages

By the end of the lesson you should be able to:

- name types of topology and wired technologies
- describe where they are used
- explain why they are best suited for these applications

Networks

A network is two or more computers (or other electronic devices) that are connected together for the purpose of communication.

They are connected by a wired medium such as cables, or by a wireless medium such as Wi-Fi.

A computer or device that is not connected to a network is called a **stand-alone**.

Today, many different types of computer are connected to some form of network.

As well as PCs, many other devices can be connected, such as smartphones, smartwatches, fitness trackers, car engine management systems, internet-enabled fridges, intelligent personal assistants and media boxes.

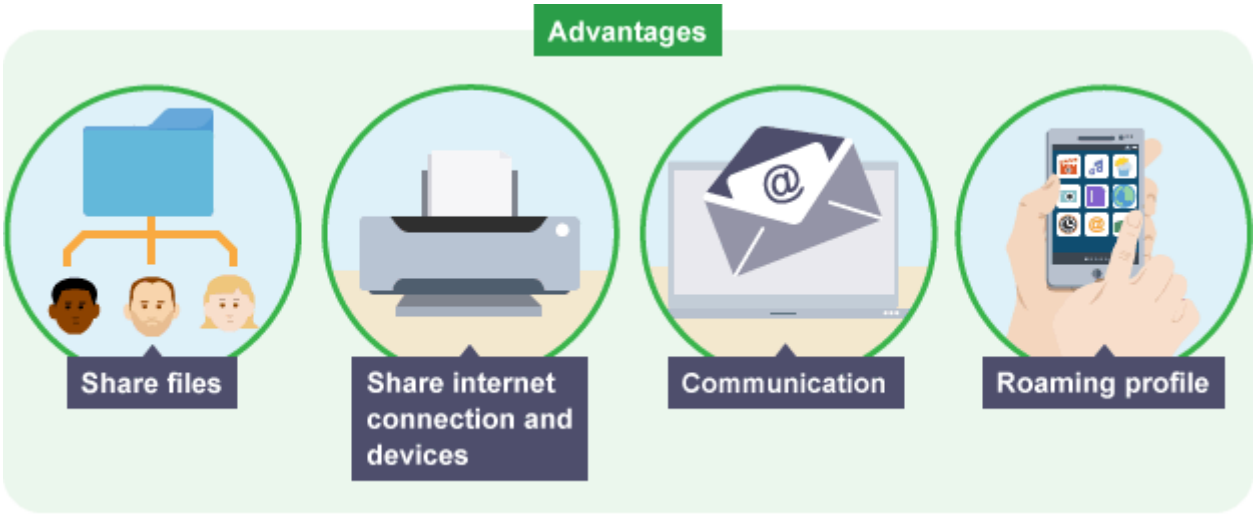
Advantages

Computer networks bring a number of benefits:

- file sharing - users can share files with other users
- hardware sharing - users can share hardware, such as a printer
- communication - users can communicate via email, chat, or by video
- roaming access - users can sign in to any computer on the network and be able to access their files

On larger networks, such as those used by businesses and schools, there are additional benefits:

- centralised maintenance and updates - network managers can apply software updates across a network, removing the need for a user to worry about having to do so
- centralised security - anti-virus software and firewalls can be implemented across a network, helping to protect user files from risks
- user monitoring - network managers can monitor what users do on a network
- levels of access - different users can be given different access rights. This gives network managers the ability to generally restrict user access to certain files, while granting permission to specific users



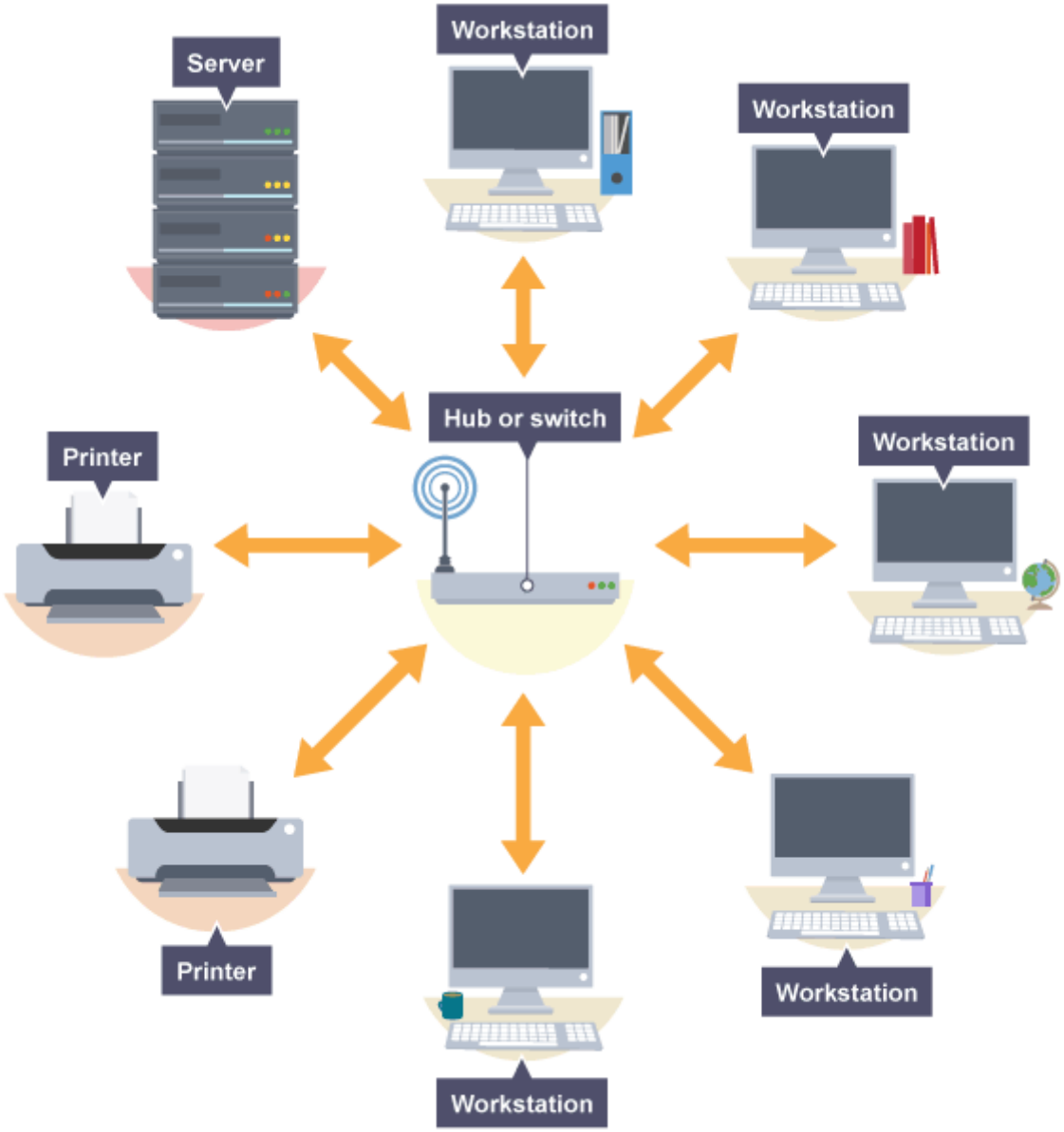
Disadvantages

- cost - additional equipment is needed to allow computers to communicate
- management - networks require management by technical staff such as a network manager
- spread of malware - viruses and other forms of malware can easily spread across an improperly secured network
- hacking - once a device is connected to another device, it is possible that data may be accessed without the device owner's permission

Local Area Networks (LANs)

A LAN is a network that is geographically confined to one building or site. Examples include networks employed by small businesses, small organisations, schools, colleges, universities and in homes.

LANs are owned and maintained by the organisation.

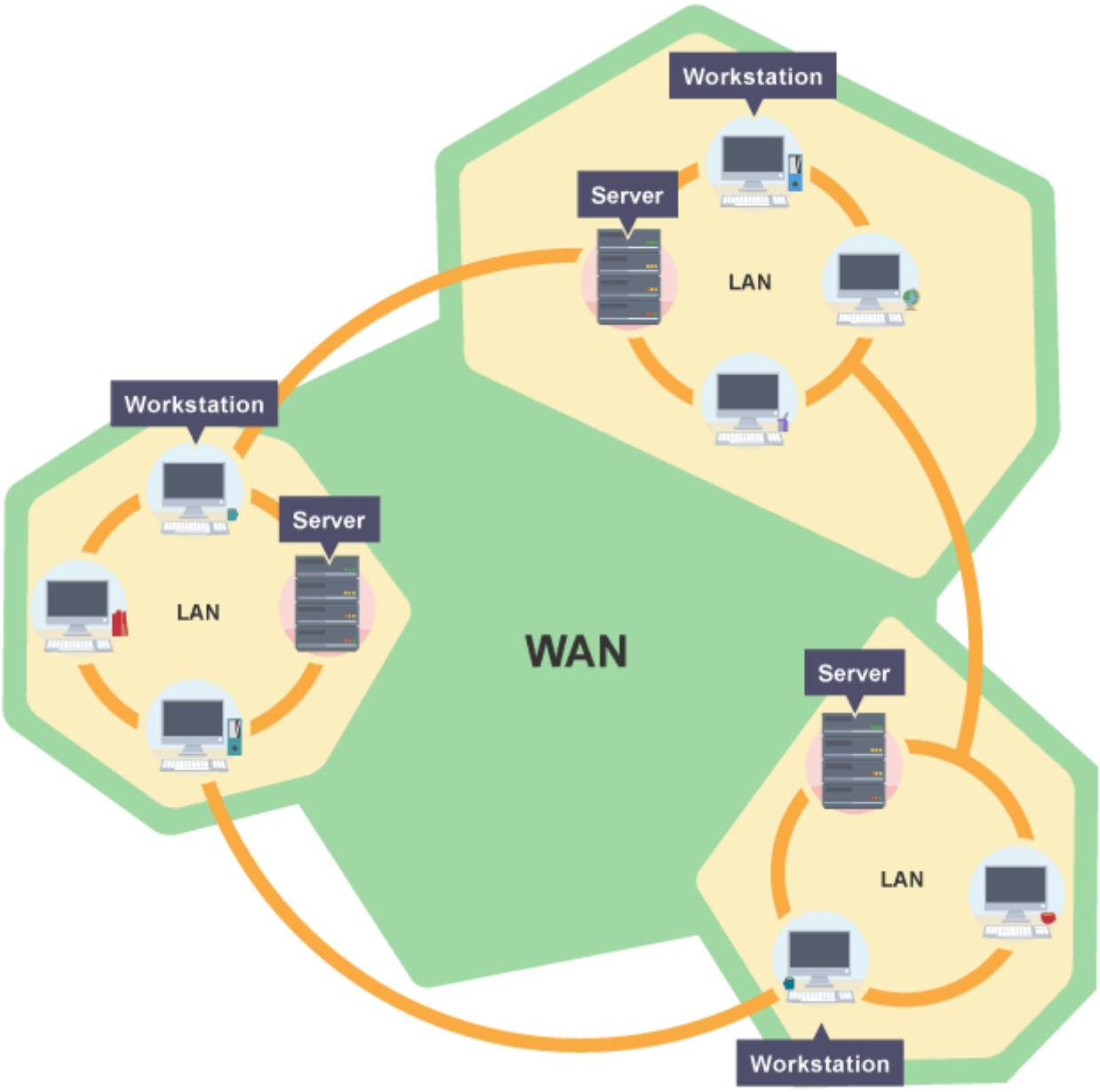


Wide Area Networks (WANs)

A wide area network (WAN) is a network that is spread over a wide geographical area. It can cover more than one site, or be spread across a country, or even the world.

Organisations that have more than one office or branch, such as banks, tend to use a WAN. The WAN allows the head office to communicate and share data with the sub-offices and branches. Communication is done through national telephone infrastructures or via wireless transmission. Each office or branch has its own LAN that is connected together using the WAN.

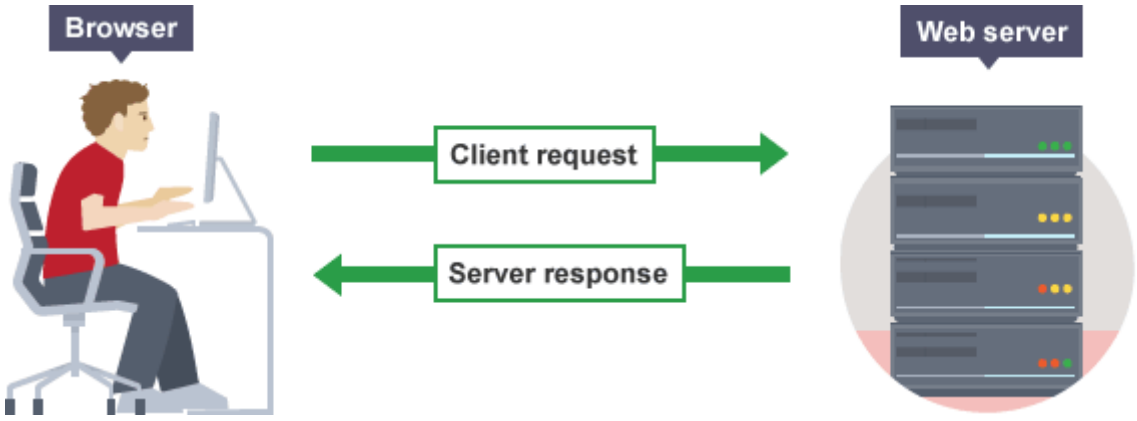
The internet is essentially a huge, international WAN.



Tasks

Create a ***PowerPoint*** presentation called 'Wired Networks' and collect notes and images to complete the tasks.

- **State** what peer-to-peer and client-server networks are and **describe** the difference between the two (Grade 3/4)



- There are many different ways LANs connect clients and servers. These are called topology. **Find** several LAN topology types. **Copy** images of several. **Describe** where some of them are most useful and **explain** their advantages and disadvantages (Grade 5/6)
- The Internet has different types of servers to perform network tasks; **outline** the function of these servers and **explain** how they work with other parts of the network (grade 6/7)

> file servers
>
> applications servers
>
> web servers
>
> print servers
>
> mail servers

- Create an annotated timeline of wired network connections. The first was the telegraph https://nrich.maths.org/2198 which used Morse code and messages could transmit at an equivalent speed of 3 bytes per second. Follow up with more modern methods (below), giving the physical medium (type of 'wire' , the data rate of transmission, and other technical details. (Grade 7+)

> dial-up modem over PSTN telephone network
>
> ISDN upgrades
>
> ADSL 'broadband'
>
> Optic fibre broadband
>
> Future Technologies