Types of Network – LAN, WAN and PAN

Any network can be classified as a **LAN**, **WAN** or **PAN** based on the area that it covers. We can make assumptions about the nature of a network and how complex it is based on this classification.

LAN – Local Area Network

A school network is a classic example of a LAN

A **LAN** will usually cover a single site. So, a school network or a network used in an office will be classified as a LAN. It might cover a single building or an area within a building and will connect devices over a relatively small geographical area.

LAN are usually owned and controlled by a single organisation and may be managed by a single person or a small team. They may include a number of work stations (or terminals), as well as devices such as printers, scanners and servers.

Because LANs are private, data does not usually need to be **encrypted**.

WAN – Wide Area Network

A WAN covers a number of sites spread across a wider geographical area. Examples might include:

The main difference between LAN and WAN is the geographical area covered by the network. The network traffic on a LAN will also be lower, whereas a WAN may suffer network speed issues due to increased traffic

- an NHS network connecting doctors surgeries and hospitals within a part of the country
- a network connecting stores owned by the same company throughout a region or country
- a bank connecting branches (including mobile branches) throughout the country
- a county council connecting service points across the county

The main purpose of a WAN is to allow communication and the sharing of data/files across a wide area. The more public nature of WANs means that data is usually encrypted.

In the UK, most connections are owned by companies like British Telecom. Some organisations with particular security needs may have their own connections between sites (e.g. the Ministry of Defence)

Each of the sites connected by a WAN may well have a LAN operating within it. The connection between the LANs may use telephone or broadband cables owned by another organisation.

The Internet as a WAN

The **internet** can be considered to be a particularly large example of a WAN.

In the case of the internet, the components making up the WAN are clearly not owned by the same organisation. This is an example of the **collective** or **distributed** ownership of the network.

The internet is actually an example of a Mesh network topology where nodes are linked to many other nodes.

One of the strengths of the internet is that it is collectively owned and there are many links between nodes. This means that if parts of it fail that there are other ways to route data between nodes, creating a network that is stronger overall – although at the cost of no one having overall control.

PAN – Personal Area Network

A **PAN** covers a very small geographical area, usually centred on one person or device. You only need to know about PAN connected using **Bluetooth** technology.

Examples of a PAN include:

- a games console using a Bluetooth controller and Bluetooth headphones
- a cell phone using Bluetooth headphones or a Bluetooth speaker
- a computer in a classroom using a Bluetooth connection to connect to a data projector
- a personal computer using a Bluetooth keyboard and mouse

> Bluetooth and Wi-Fi are similar but different. Bluetooth is more suitable for instant, ad-hoc connections with limited data flows.

Using Bluetooth connections increases flexibility and ease of use, although at the cost of some security risk and the need to use batteries or make sure devices are charged.

Bluetooth

> The Bluetooth symbol is a Norse rune combining Harald Bluetooth's initials.

Bluetooth technology uses wireless signals to connect devices together over a short distance – typically less than 10 metres. It was developed by Ericsson in Sweden in the early 1990s and is named after the 10th century Danish king Harald Bluetooth. It can be used for a range of devices, including running smart watches, connecting thermostats on radiators to cell phones, connecting a pedometer to a cell phone and even in hearing aids.

Activity 1:

a) Complete a copy of the table below to summarise the differences between LAN, WAN and PAN

Type	Meaning	Geographical area covered	Examples of Use
LAN			
WAN			
PAN			

b) Give an example of an organisation which might use a LAN

c) Give **one** difference between a PAN and a LAN

d) **Explain** two differences between a LAN and a WAN (4 marks – needs developed points)

e) Explain what **distributed ownership** means in the context of a WAN

Activity 2:

In the following cases, state which network type (LAN, WAN or PAN) would be most likely to be used

a) within the office of Obidos Travel, a travel agent with seven customer service agents

b) by Roys of Wroxham for stock control. Roys operate eight stores across East Anglia

c) by a teenager to download music

d) by a lorry driver to connect her phone to the audio system in the cab of her lorry