

7.2 Networks

This unit begins by defining a network and addressing the benefits of networking, before covering how data is transmitted across networks using protocols. The types of hardware required are explained, as is wired and wireless data transmission. Learners will develop an understanding of the terms 'internet' and 'World Wide Web', and of the key services and protocols used.

LAN Hardware

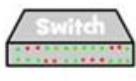
Server

Stores all user data and information within a network in a central location. This allows users to log into any work station access their files.



Switch

Using Ethernet cables to connect to both the server and individual work stations, a switch directs information between the server and individual workstations.



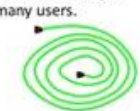
Router

Allows wireless connection of mobile devices to a network if within suitable range. Allows several devices to be connected at the same time.



Ethernet Cable

Networking hardware used to connect one network device to another. They can be used to share devices such as printers and scanners amongst many users.



What is a network?

A network is two or more computers (or other electronic devices) that are **connected together**, usually by cables or Wi-Fi.

Some computer networks will have a server. A server is a powerful computer that often acts as a central hub for services in a network, eg emails, internet access and file storage. Each computer connected to a server is called a client.

Networks

LAN – Local Area Network, connects devices together over a small geographical location e.g. a building. They connect computers using a combination of Ethernet cables and switches and require a Network Interface Card.

WAN – Wide Area Network A computer network where devices are connected over a large geographical area (e.g. the internet). They require access to the internet via a router / modem.

WPAN – Wireless Personal Area Network used to connect devices to your personal computer system without the use of wires. Most commonly uses Bluetooth. E.g. connecting a peripheral device to your laptop, connecting a mobile phone to a car, wireless headphones to your phone etc.

Internet

- Is a global network of interconnected networks. World Wide Web is all the webpages that are accessible via the Internet.

Domain name server

- Converts a website address into an IP address e.g. www.google.co.uk into IP address 172.217.14.195 that a client machine can make a request to the server hosting the webpage

Data travels

- Data travels as small packets of information between computers.
- It is broken down and then rebuilt back up into readable information like a sentence been broken up then put back together again.

Advantages of networks

- sharing devices such as printers saves money
- site software licenses are likely to be cheaper than stand-alone
- Files can be easily shared between users
- network users can communicate by email and instant messages
- Security is good, users cannot see other users' files like a stand-alone
- Data it is easy to backup and stored on a file server

Disadvantages of networks

- Purchasing network cabling and service is expensive
- You need a network manager to run a large network that is complicated
- If the fileserver breaks down your files are not accessible
- Viruses can spread more quickly through computer network
- Danger of hacking particularly wide area networks, you need security procedures tax, abuse, e.g. A firewall

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|--------------|---|
| Internet | A collection of inter connected networks and devices that communicate and send data between each other |
| DNS | Domain Name Server. Remembering www.google.co.uk is easier than remembering 173.194.34.95 . Converts from number to address |
| IP Address | Like every front door in the world, every computer in the world has a separate, unique address |
| URL | Uniform Resource Locator. A URL is a web address. All web addresses are unique |
| HTTP | HyperText Transfer Protocol . A protocol is a set of rules HTTP defines the rules used by web browsers and servers to exchange information |
| Data Packets | Data transmitted over the Internet is broken down into smaller chunks or packets to be sent |
| Bandwidth | The amount of data that can be carried at a time |
| WAN | Wide Area Network: Cover a large geographical area (eg Bank, Hospitals) |
| LAN | Cover a small geographical area (a home network or a school) |
| NIC | Network Interface Card. Can be wired or wireless, Needed to connect to Internet |
| Buffering | The delay whilst the internet downloads data needed (usually during streaming) |