1.3A Wired & Wireless Networks

Keywords & Definitions

Network - Two or more computers connected together

Node - A device connected to a network via a link

LAN- Local Area Network over a small geographical area

WAN- Wide Area Network over a large geographical area

DNS: Domain Name Server. An internet service that translates alphabetic names into IP addresses

IP Address: Unique address given to a website

Web Server: A web server hosts websites

Internet: A network of networks (WAN)

WWW: World Wide Web—a collection of websites

Types of networks

LAN
- Local Area Network
- Spread over a SMALL geographical location (usually within one building)
- Hardware is owned by the organisation

WAN
- Wide Area Network
- Spread over a LARGE geographical location (usually 1 mile or more apart)
- Uses external hardware/infrastructure

Benefits of networks
- Share resources (printers etc)
- Share files/data
- Communication is easier
- Data can be backed up centrally

Switch - Connects devices on a LAN. Receives data and sends data to THE CORRECT DESTINATION.

OR

Hub - Connects devices on a LAN. Receives data and sends data. Not as intelligent as the switch.

Hub - Connects devices on a LAN. Receives data and sends data. Not as intelligent as the switch.

Hardware needed to set up a network

Router - Directs data packets across the network

Cables - Ethernet, Coaxial, fibre optic (fibre optic is the fastest)

Wireless Access Point (WAP) - Enable devices to connect wirelessly

1.4 Wired & Wireless Networks

Factors that affect a networks performance

- **Number of uses** - too many users could cause congestion/less bandwidth available. This will also mean there is more traffic
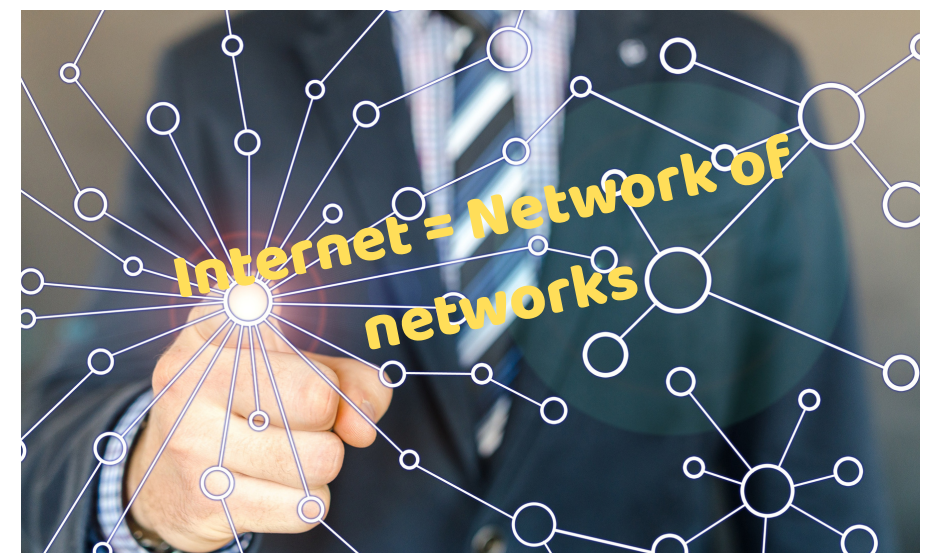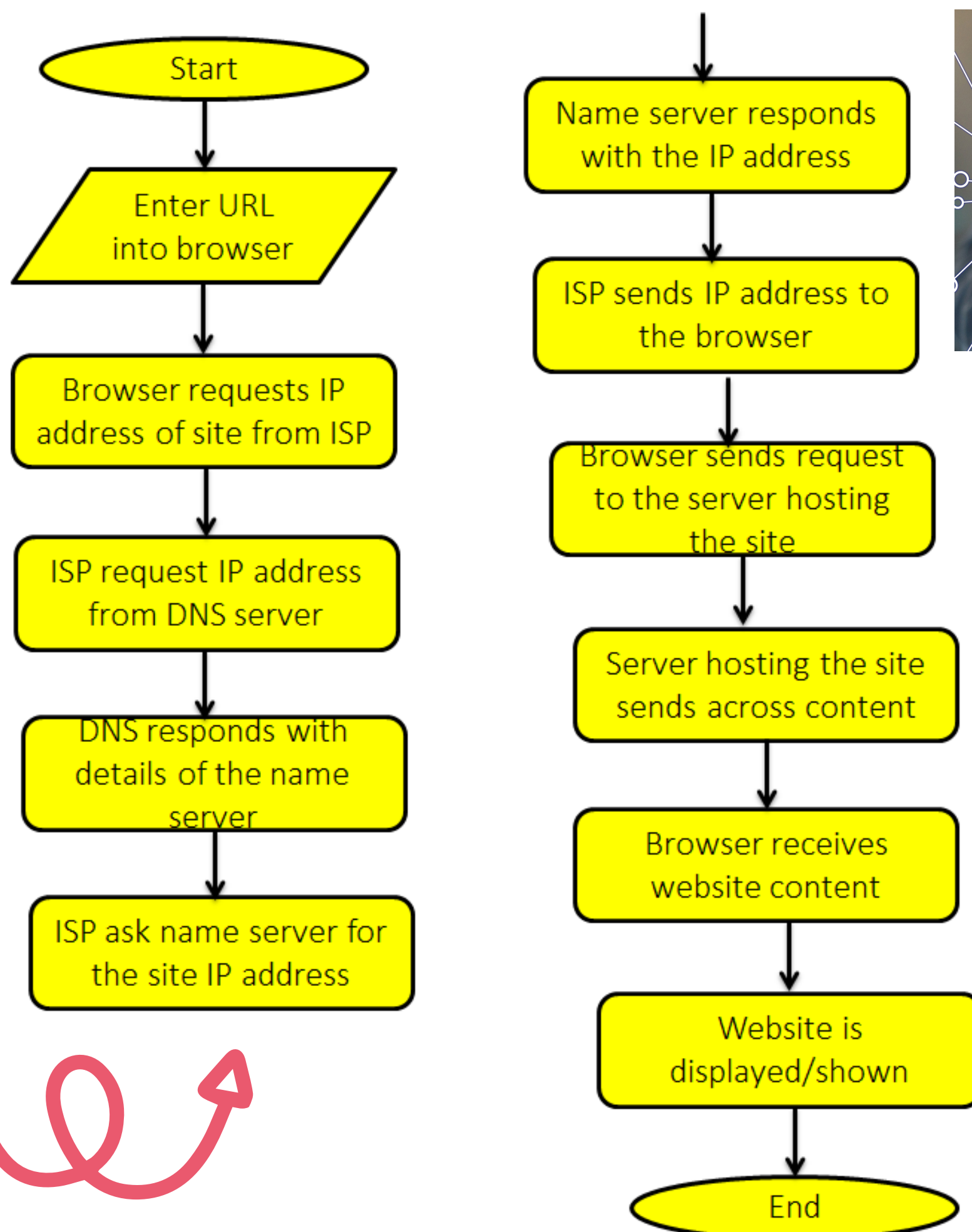
- **Bandwidth** - the amount of data that can be transmitted in a given amount of time (Mbps)

- **Latency** - the amount of time taken for data to travel through the network

How the Internet works

```
        Start
          ↓
   Enter URL
   into browser
          ↓
  Browser requests IP
  address of site from ISP
          ↓
  ISP request IP address
  from DNS server
          ↓
  DNS responds with
  details of the name
  server
          ↓
  ISP ask name server for
  the site IP address
```

```
          ↓
  Name server responds
  with the IP address
          ↓
  ISP sends IP address to
  the browser
          ↓
  Browser sends request
  to the server hosting
  the site
          ↓
  Server hosting the site
  sends across content
          ↓
  Browser receives
  website content
          ↓
  Website is
  displayed/shown
          ↓
         End
```


Internet = Network of networks

In a nutshell:

- A DNS translates a website's domain name into its IP address
- The Internet has a network of Domain Name Servers, meaning you don't need to remember IP addresses to access websites—you can use domain names instead

1.4 Wired & Wireless Networks

Virtual Networks

- Software based/ non-physical
- Secure network
- Used by partitioning part of the physical network
- Controlling computers and devices remotely using the internet
- It is set up so that only certain devices can see each other

Cloud Computing

Advantages:

- Able to access/share files anywhere with internet access
- Easy to increase storage
- No need to buy expensive hardware to store data
- No need to pay for IT staff to maintain/manage
- Data will be automatically saved

Disadvantages:

- Need connection to the internet to access
- Risk of hackers
- work is not necessarily Copyright protected as it is Online through a third party

## Client Server VS Peer to Peer

Client Server

- At least one computer is designated as a server
- All files can be stored centrally on a Client-server
- Backups are easily managed on a Client-Server as these can be done centrally from the File Server
- Security is managed from the central server (antivirus, firewalls etc)

Peer to Peer

- All computers have the same status
- files are stored on their own computers
- all computers are responsible for backing up their own files
- Individual security may need to be installed on individual machines
- appropriate for a small number of computers (office, small building etc)
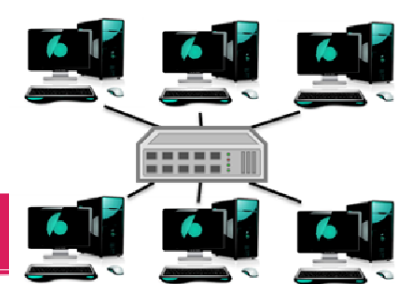
World of work links

Programmer, IT Technician, Software Engineer, Teacher, Systems Architecture, Data Engineer, Software Developer