# Wired and wireless networks

## LAN

**“Local Area Network”**

**“Small geographic area. All the hardware for the LAN is owned by the organisation using it. Wired with UTP cable, fibre optic cable or wireless using routers and Wi-Fi access points.”**

# Wired and wireless networks

## WAN

**“Wide Area Network”**

**“Large geographic area. Infrastructure is hired from telecommunication companies who own and manage it. Connected with telephone lines, fibre optic cables or satellite links.”**

# Client-Server Network

**“A client makes requests to the server for data and connections. A server controls access and security to one shared file store. A server manages access to the internet, shared printers and email services.  A server runs a backup of data.”**

# Peer-to-Peer Network

**“All computers are equal. Computers serve their own files to each other. Each computer is responsible for its own security and backup. Computers usually have their own printer.”**

# Stand-Alone Computer

**“A single computing device not connected to any other on a network, either wired or wireless.”**

# Wired and wireless networks

## WAP

**“Wireless Access Point”**

**“A networking hardware device that allows a Wi-Fi device to connect to a wired network.”**

# Wired and wireless networks

## Router / Switch

**“In packet-switched networks such as the internet, a router is a device or, in some cases, software on a computer, that determines the best way for a packet to be forwarded to its destination.”**

# Wired and wireless networks

## NIC

**“Network Interface Controller”**

**“A computer hardware component that connects a computer to a computer network.”**

# Transmission Media

**“The physical media over which data is transmitted, e.g. twisted copper cable, fibre optic etc. ”**

# Wired and wireless networks

## DNS

**“Domain Name System”**

**“The Internet’s equivalent of a phone book. They maintain a directory of domain names and translate them to Internet Protocol (IP) addresses. This is necessary because, although domain names are easy for people to remember, computers or machines access websites based on IP addresses.”**

# Wired and wireless networks

## Hosting

**“Websites stored on dedicated servers. Reasons include: Websites need to be available 24/7. Accessed by thousands of users at a time. Strong protection from hackers. They need an IP address that doesn’t change.”**

# Wired and wireless networks

## The Cloud

**“Remote servers that store data that can be accessed over the internet. Advantages: Access anytime, anywhere from any device. Automatic backup. Collaborate on files easily.”**

# Virtual Networks

**“A logical software based network. Advantages: + Increased security, including more secure access to the network remotely. + The network can easily be expanded with less impact on the infrastructure and cost. + Log in to work from home.”**

# Producing robust programs

## Defensive Design

**“Defensive design is the practice of planning for contingencies in the design stage of a project or undertaking.”**

# Producing robust programs

## Input Sanitisation / Validation

**“Ensuring data input by the user meets specific criteria before processing. Range check. E.g. between 1 and 31. Type check. E.g. number not symbol. Presence check. E.g. data has been input. Format check. E.g. postcode is LLN(N) NLL. ”**

# Producing robust programs

## Authentication

**“Verifying a user identity before they can use a program with username and password. Strong passwords over a certain length with symbols and mixed case are advised.”**

# Producing robust programs

## Maintainability

**“A selection of techniques and methods that make code easy to debug, update and maintain.”**

# Producing robust programs

## Comments

**“Used by a programmer to explains sections of code.  Ignored by the compiler.”**

# Producing robust programs

## Indentation

**“Indenting makes it easy to see where structures begin and end. Conditions and iterations should be indented. Code inside procedures and functions should be indented.”**

# Producing robust programs

## Testing

**“This involves testing the program under various conditions to make sure it is going to work. You need to think about what devices it could be used on and what might cause the program to crash.”**

# Producing robust programs

## Iterative Testing

**“Each module of a program is tested as it is developed.”**

# Producing robust programs

## Final / Terminal Testing

**“Testing that all the modules of a program work together as expected. Checking the program meets the expectations of the user with real data.”**

# Producing robust programs

## Syntax Errors

**“Rules of the language have been broken. The program will not run. Variables not being declared before use. Incompatibility of variable types. E.g. sum = A Using assignments incorrectly. E.g. 2 + 2 = x Keywords misspelt. E.g. PRNT(“Hello”)”**

# Producing robust programs

## Logic Errors

**“The program runs but does not give the expected output. Division by zero. Infinite loop. Memory full. File not found.”**

# Producing robust programs

## Test Data

**“Values used to test a program, includes normal test data, boundary test data and erroneous test data.”**