**Unit 11 Computer Networks**

**Designing a network**

If you want to end up with a network that meets its users’ needs, it is important to design it carefully.

**Requirements**

Designing a network is a skilled task. It usually requires a senior IT professional who can draw on experience and an up-to-date knowledge of network components to create a useful system.

The starting point for a network design should be a requirements document that clearly states everything required from the network. The requirements document can be created from a client brief or could be produced internally for a network designed in-house.

When designing your network, it is important to ensure that you follow the client brief. If you discover a problem with the brief, you should explain this to the client and discuss possible ways to resolve it.

The requirements document should include:

* The purpose of the network to summarise why the system is needed
* The requirements (detailed objectives) of what the proposed network needs to be able to do
* How many users there will be, with details of their roles
* The size of the network
* The location of the network, with any geographical issues
* The budget, setting out how much the network can cost
* Any constraints, including the software and hardware you have available to implement the network.

Initial design ideas

Your design for the network must include details of the following areas:

**Users’ needs**

This section in your design document describes what services and resources each type of user will need the system to provide for them.

**Hardware components**

Your design must list the hardware components the network will need. These will include the computers, network cards, switches, cabling and any other peripherals or devices that you identify for your system.

**Topology**

Think about the kind of topology that will be appropriate for your network.

**Software resources**

Your design must list the software resources your network will need. You should identify the network operating system(s), applications and any utility software you think your network will require.

**Names and roles of the network users**

Your design documentation must identify how many network users there will be for your system, with their names and roles. A table in your documentation is an effective way of doing this. You may identify one or more users who will be given administrator responsibilities for maintaining the computer network.

**Network diagram**

Your network diagram must explain the structure of your network and give a good guide as to how the network will be set up. This diagram needs to include the positioning of the network devices and other equipment, and show clearly how they are to be connected. The diagram should demonstrate that you have considered the IP addresses of the servers, workstations and printers in your network.

**Test plan**

Your test plan needs to outline the tests you will perform when the network is up and running. You need to choose the tests carefully to prove that the computers connect to each other, the user logins work, and that users are able to access the necessary networked resources.

**Alternative solutions**

There will be more than one way in which you can design your intended computer network, using different topologies, hardware components or network architectures. You might, for example, design a cabled network and include wireless as an alternative solution.

It is always useful to think of alternative solutions when drawing up a design, as it makes you consider carefully the system you have chosen.