Learning aim B: Design a computer network

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| **Designing a network**  Requirements of the brief, to include:   * purpose * requirements/objectives/activities (refer to assessment guidance) * details of the users and their roles/function (including number of users) * size/geographical spread/location * costs (budget) * constraints.   Initial design ideas and alternative solutions to developing the intended computer network. There will be more than one way to develop the same computer network using different topologies, hardware components and network architectures.  **Hardware components in the network** Features of hardware components:   * their role/purpose * how they connect * how they communicate with other components in the intended computer network. Hardware components, e.g.: * computer systems/workstations/servers * network adapters (wired/wireless) * router (wired/wireless) * hub * switch * network cabling (e.g. fibre optics, UTP, STP, coaxial; connectors) * wireless (e.g. infrared, Bluetooth, laser, narrow-band [single-frequency] radio).   **Software components in the network**  Features of software components:   * their role/purpose * their relationship with other components in the intended computer network. Software components, to include: * applications (e.g. internet browsers, firewalls, email, antivirus, network utilities (remote management), office applications) * operating system with appropriate utilities capable of operating in a network environment.   Constraints to consider:   * costs (e.g. component cost for the intended computer network) * technical constraints (e.g. hardware and software availability).   *continued* |

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What needs to be learnt

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| Design documentation To include:   * computer network set-up and configuration, e.g. IP addressing/subnet masks (if appropriate), security, sharing files and folders, access permissions for users, managing user accounts (add, remove and amend), and sharing hardware/software resources, e.g. internet, printers, storage devices * network user rights (e.g. administration rights, access control rights, shared resource rights) * network diagram (e.g. structure of the network, components, positioning of the components, connection medium and IP addresses (if applicable)) * test plan with test data to test functionality (e.g. testing the connectivity between all devices on the network). |

HELP!

**Some answers to the questions you should ask!**

1.All users should be able to access the internet through the ADSL internet connection.  
2.All users should be able to print via the network.  
3.All users should have secure wireless access to the network, with the flexibility to connect via LAN.  
4.A file server for sharing files on the network.

(Which user has access to customer data?

Who has access to staff data?

Who has access to the music files)

5.Hosted Email servers for email access.

6. Hosted website for customers  
7.Administrator should be able to remotely view and control the file server from any location on the internet.

**Where can I find hardware information?**

<http://www.broadbandbuyer.co.uk>

DrayTek Vigor 2860n

* 3-WAN Simultaneous : VDSL/ADSL, Ethernet and 3G(USB)
* High performance - up to 300Mb/s firewall throughput
* DrayTek Firewall with huge flexibility (built in firewall!)
* 6-Port Gigabit Ethernet LAN Switch
* VPN Trunk/Backup to remote sites
* USB Port for Printer, Logs or 3G Modem

NETGEAR GS108 v3 ProSafe 8-Port Unmanaged Gigabit Switch (example)

You will need another switch to connect to the routers built in switch due to the distance from the various devices the Etherrnet cable maximum length is 100 metres

Ethernet cables

<http://www.broadbandbuyer.co.uk/products/1164-belkin-a3l791b03m-s/>

**More information on routers and switches**

<http://www.cisco.com/cisco/web/solutions/small_business/resource_center/articles/connect_employees_and_offices/networking_basics/index.html>

<http://www.cisco.com/cisco/web/solutions/small_business/resource_center/articles/connect_employees_and_offices/primer_building_a_small_office_network/index.html>

**What is WEB HOSTING**

**Much easier to have your customers go to a hosted site safer for your network and the hosting company provide support.**

<https://uk.godaddy.com/hosting/web-hosting.aspx>

<http://www.ehow.com/about_4699250_what-web-hosting.html>