Networks Mark Scheme

1 Physical configuration/layout [1] of how a network is connected/linked together [1] #

2 Must identify the issue and expand on it.

* *size of organisation [1]*
	+ Needs can range from a small LAN to a global WAN.
	+ Some communications media are limited to the distance they have to travel.
	+ Amount of data processing required must also be considered.
* *how the system will be used [1]*
	+ What type of applications do users require?/ Are the users going to require a wide range of applications?
	+ Will they need large data storage?
	+ From where will they operate the network e.g. at home in office or remote access from different locations.
* *existing systems [1]*
	+ More often networks are not developed from scratch but need to fit in with existing systems. Sometimes an extension is required e.g. when a new branch office opens.
	+ Therefore any new network must fit in with the existing operating systems and protocols.
	+ It must support any peripherals already in use e.g. bar code readers, printers, OS etc.
* *performance required [1]*
	+ Different parts of the organisation may have different performance requirements, e.g a real time e-commerce system may require greater speeds and capacity and security than the in-house payroll system
	+ A system for a school may have different requirements that a system needed for a group of ICT technicians

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Advantages of ring

* Network not dependant on central computer
* Each computer has the same access as the others so no one computer can hog the network

Disadvantages of ring

* If there is a break in the connection then the whole network fails
* Faults are difficult to locate
* It is impossible to keep the network running whilst equipment is added or removed
* because there is only one path for the data to follow



**Advantages**

* Easy to install
* Easy to add extra workstations
* Uses less cable than a Star network
* Best choice for temporary networks

**Disadvantages**

* If there is a problem with the central cable/backbone, the entire network stops working
* If there are a lot of workstations on the network, data can travel slowly.
* Data collisions can happen as the network becomes busy
* Low security - every workstation can see all of the data in the network



Advantages of star

* Fault tolerant – if one of the cables fails, then the other computers can still be used
* Load tolerant – extra computers can be added without much loss in performance because all computers have their own path to the server
* Easy to add extra computers – extra computers can be added without disturbing the

Disadvantages of star

* Higher cost – the large amount of cabling needed makes it more expensive
* Dependence on the central server

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**Advantages**

* allows inexpensive LANs to be set up without cables
* allows people the freedom of working anywhere a signal can be received
* ideal for networks in old listed buildings where cables would not be allowed to be installed
* global set of standards – you can use Wi-Fi all over the world
* can use a variety of devices such as tablets, mobile phones, etc
* health and safety – tidier desktop with no trailing cables.

**Disadvantages**

* power consumption is high – which means laptops soon exhaust their rechargeable batteries
* there may be health problems in using Wi-Fi
* there may be security problems even when encryption is used
* Wi-Fi networks have a very limited range (e.g. 150 ft)
* can get interference if wireless network signals start to overlap
* transmission speed slower than cable.