Key information:

Card: 3.1

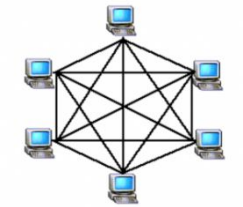
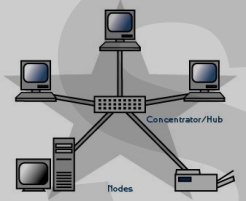
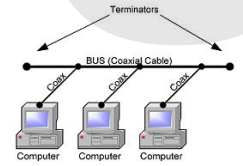
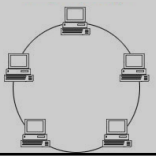
Network Scale	
LAN	A Local Area Network. All devices are connected on one site. The network may be in a single building or campus or group of buildings in a small area. Management and maintenance is usually completed by a group of network engineers.
WAN	A Wide Area Network. Typically covers a large geographical area, talking in many cities or worldwide. The connections are typically provided by a telecoms company such as BT. The largest example of a WAN is the internet. A WAN connects multiple LAN networks.
PAN	Personal Area Network. Personal devices are often connected to each other in a home or a car.
WLAN	Wireless LAN
MAN	A Metropolitan Area Network (MAN) is a network that connects users with computer resources in a geographic area sized between that of a LAN and WAN.
VPN	Virtual Private Network. A part of the internet that is sealed off from public use and reserved for an organisation. It is not a physical network but behaves as one.

Network Organisation	
Client – Server	One or more computers are designated as servers, providing a service to clients on a network.
Peer-to-peer	A distributed system where functionality can be divided among the nodes on the network. All computers have an equal status and may partially act as a server to other devices. Peers are both suppliers and users of network data and services.

Gateway	A gateway joins together two networks that use different base protocols, e.g. links a LAN to WAN.
Bridge	A bridge joins together two networks that use the same base protocols, e.g. links LAN to LAN.
Hub	A hub copies all packets of data to all devices on the network.
Switch	A switch analyses each packet of data and sends it to the computer it was intended for.
Routers	A router stores the addresses of computers on the network and transfers data between devices.

Key information:

Card: 3.2

	**Mesh network** Each node relays data for the network. All mesh nodes cooperate in the distribution of data in the network. This is very reliable and a network can 'self heal' by reconfiguring itself around broken paths. A network is complex, expensive and difficult to set up. A large part of the network may be redundant.
	**Star network** Where one or more central switch, hub or computer acts as a central conduit to transmit messages. Very reliable and high data transfer speeds are possible (fewer collisions) and easy to identify faults. Can be expensive to set up, if main switch fails, the network fails and bottlenecking can occur if too much data is passing through the central switch.
	**Bus network** Nodes are directly connected to a common linear cable (or bus). Cheap and easy to set up but can be slow under heavy traffic (due to collisions) and a break in the main bus will break the network.
	**Ring network** Each node connects to exactly two other nodes, providing a single pathway for signals through each node. High transfer speeds but can fail if one node fails.

Key information:

Card: 3.3

Network protocols are vital to allow computers on networks to communicate. Without shared common protocols, computers would not be able to communicate.

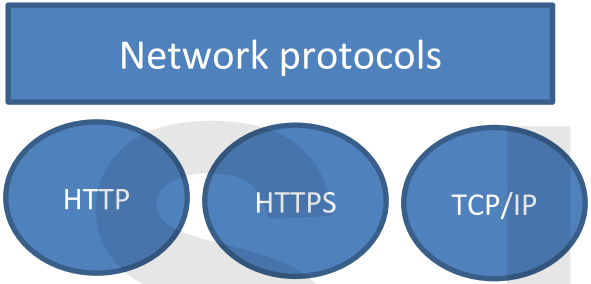
Email protocols

IMAP= internet message access protocol - transfers emails between computer systems via the internet. The IMAP protocol however is generally used for email retrieval and storage as an alternative to POP.
POP3= post office protocol 3 – is a protocol for receiving email, in which email is received and stored by an email server with a client downloading messages when ready.
SMTP= simple mail transfer protocol –mail servers use SMTP to send and receive mail messages, mail applications typically use SMTP only for sending messages to a mail server.

Key information:

Card: 3.4

Network protocols are vital to allow computers on networks to communicate. Without shared common protocols, computers would not be able to communicate.



HTTP – hypertext transfer protocol – allows webpages to be shared across different computers and browsers.
HTTPS – A secure variant of HTTP – it works together with another protocol, Secure Sockets Layer (SSL), to transport data securely.
TCP/IP– transmission control protocol/ internet protocol – is the basic communication language or protocol of the Internet.
Ethernet – wired (cable connection) protocol.
Wi-Fi – wireless, two common standards are Bluetooth and 801.11.

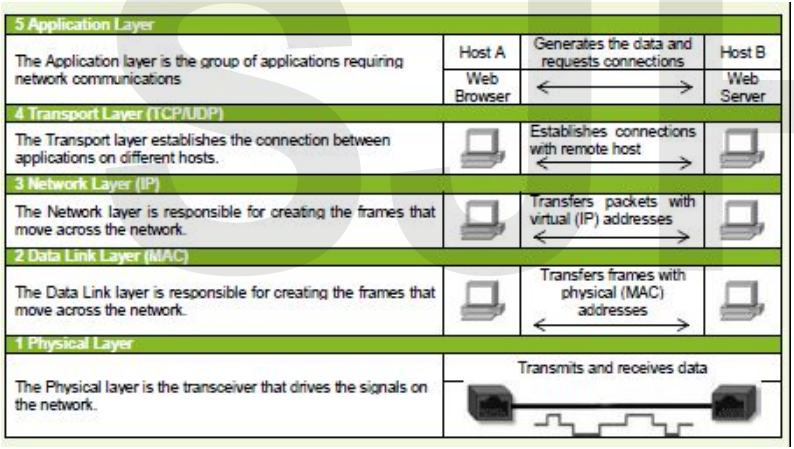
Key information:

A data packet consists of:

Card: 3.5

Source address	Destination address	Info about how the data is to be reassembled	Tracking info	The DATA	Checksum (error checking)

The TCP/IP protocol has 5 layers



Source (Start)

Destination (End)

The data packet visits each protocol going down and back through them to get to destination

Goes through a network

Key information:

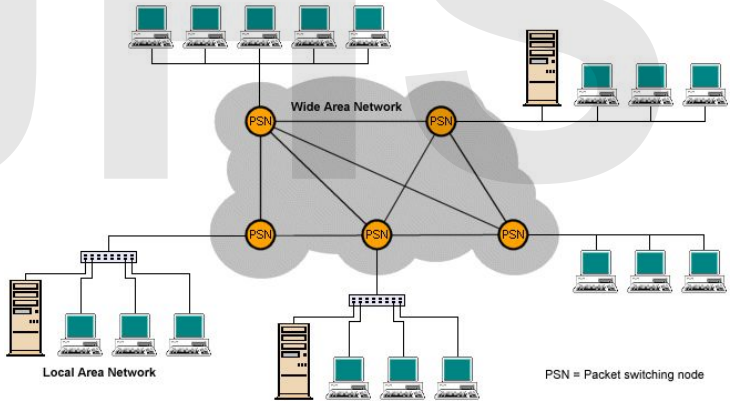
Card: 3.6

Circuit switching requires a series of connections to be made to form a single route and that all data traverses the same route.

- This is susceptible to interception and failure as failure of any one connection results in failure of the entire route.
- The line is reserved when in use.

Packet switching differs in that the data is broken into packets that all traverse different routes.

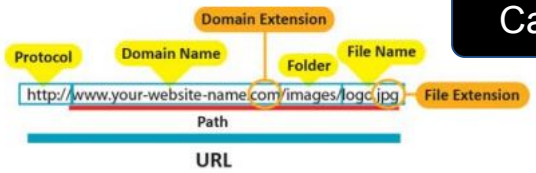
- The data is reassembled once it arrives at the destination.
- Packet switching is less susceptible to interception and is more robust because if a route fails then the packet can use an alternate route.



Card: 3.7

Key information:

DNS translates between a web address and IP address and vice versa



Step 1
You ask your ISP to find an address. It looks it up in its local DNS cache by asking what IP address corresponds to your web address. If known it will send it to you. If not it will ask a DNS server from your ISP

Step 2
The DNS server looks up the IP address in its cache. If found it will send it to you. If not it will seek it from another DNS server. If not found in any DNS servers you get an error message back

Step 3
Your request for the page is sent to the location it is stored on

Step 4
Your request is processed and results returned to you

A good website to visualise this process in more detail=
https://www.verisign.com/en_US/website-presence/online/how-dns-works/index.xhtml
Or search= How DNS words Verisign