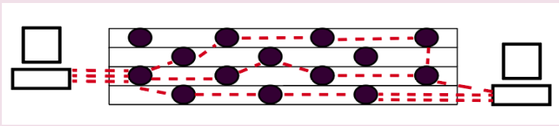
Component 1: Networks

Term	Definition
Networking standards	Networking standards exist to ensure products of different manufacturers are able to work together in a network without risk of incompatibility.
OSI	Open Systems Interconnection - a reference model for how applications communicate over a network.
Network Protocol	A set of rules that determine how data is transmitted between different network devices.
Protocol stack	A set of protocols that work together to provide networking capabilities.
Routing	The method of selecting paths along which packets are sent on a network using routing costs, based on bandwidth and routing overheads.
The Internet	A global computer network providing information and communication facilities; consisting of many interconnected networks.
IP Address	The unique identifier of a computer system on a network.
DNS	Domain Name System. A system for matching IP addresses to computer system resources.
Web Browser	An application used to access websites and render their html code to allow viewing.

Packet Switching



Data being split into data packets that are transmitted individually and may take different routes to the destination. When all the packets have arrived, the data is reassembled. The internet is an example of a packet-switching network.

Packets are intended to transfer data reliably and efficiently. Instead of transferring a large file as a single block of data, sending smaller packets helps ensure each section is transmitted successfully. If a packet is not received only the missing packet needs to be re-sent. If a data transfer encounters network congestion, the remaining packets can be re-routed through a less congested path.

Contents of a data packet

A typical packet includes two sections — a header and payload. Information about the packet is stored in the header, including:

- Source and destination addresses
- Packet ID and transmission protocol
- Payload length - size of the data
- ID of the following packet

The payload section of a packet contains the actual data being transferred. Often just a small part of a file, webpage, or other transmission.

URL (Uniform Resource Locator) or web address has three basic parts - the protocol, the domain name and the path.

OSI 7 layer protocol stack model

Layers	Protocol
Layer 7 *Application*	Hypertext Transfer Protocol (HTTP). Hypertext Transfer Protocol Secure (HTTPS) Simple Mail Transfer Protocol (SMTP) File Transfer Protocol (FTP) Applications that users interact with directly, such as web browsers and email clients.
Layer 6 *Presentation*	The translation of application format to network format, or vice versa. e.g. encryption and decryption of data.
Layer 5 *Session*	The session layer creates a session between the source and the destination nodes and terminates sessions on completion of the communication process.
Layer 4 *Transport*	Transmission Control (TCP) The Transport Layer deals with the coordination of the data transfer. How much data to send, at what rate, where it goes, etc.
Layer 3 *Network*	Internet Protocol (IP) The network layer is the most important layer of the OSI model, which performs real time processing and transfers data from nodes to nodes. Routers and switches are devices used for this layer.
Layer 2 *Data Link*	The Data Link Layer provides node- to-node data transfer (between two directly connected nodes) and handles error correction from the physical layer.
Layer 1 *Physical*	Ethernet Wi-Fi (802. 11) and Bluetooth This layer deals with the hardware of networks including cable types and radio frequency links for wireless systems.