**D1 - TCP/IP and Application Layer Protocols**

**What is TCP/IP?**

TCP/IP is how nearly all communication takes place over the internet. It stands for 'Transmission Control Protocol (over) Internet Protocol'.

This means it is a protocol that controls data transmissions between computers, using the Internet Protocol as a base for routing data.

The IP allows one computer to talk to another via addresses, and route traffic over networks, be it a home/office network or the entire internet.

The Transmission Control Protocol handles breaking the transmission into packets, and re-assembling them at the other end. Different packets might take different routes as it is the IP that determines the route, but the TCP will still assemble them at the destination.

In TCP/IP, the computer sending the transmission acts as the server (and may in fact be an actual server), and the recipient is a client of the server. Each transmission is a series of point-to-point communications. This means that each transmission is only between two computers, but may be routed via multiple servers or routers. This can be used in both the client-server and peer-to-peer models.

Most other protocols, such as HTTP, are built on top of TCP/IP. The protocol is responsible for the data in the transmission, but TCP/IP handles the making and assembling packets.

Protocols are broken into layers. IP is the lowest layer, and determines the route a packet takes to its destination. Then there is TCP, which turns transmissions into packets, and re-assembles them at the destination.

On top of that exists protocols like HTTP, which handles internet traffic over port 80, such as HTML and CSS.

As the layers of protocols ascend, they become more abstract, and handle data more than interacting with hardware.

