Network Protocols - Reading

When two computers communicate across a network they need a set of rules to be able to talk to each other. This **set of rules** is known as a **protocol**. This allows lots of manufacturers to make **hardware**, **devices** and **operating systems** that are able to **communicate** with one another. For instance, a computer running the Microsoft Windows **operating system** is able to request **web pages** from a **server** running **Linux** and **Apache** because they all use **standard** protocols.

The following table shows some common protocols used on computer networks.

Protocol	Stands for	Function
Ethernet	**Protocols in IEEE 802.3**	**Ethernet** is a family of related network protocols which relate to the physical hardware of a network. It has the standard **IEEE 802.3**. **Twisted pair copper cable** is, for example, part of this standard – hence it is often known as Ethernet cable.
Wi-Fi	**No meaning but a trademark for WLAN (Wireless LAN)**	**Wi-Fi** is a trademark for **wireless LAN** (**WLAN**). It is the standard **IEEE 802.11**. This allows devices to be connected to a switch without the need for cables.
TCP	**Transmission Control Protocol**	**Transmission Control Protocol** works in conjunction with the **Internet Protocol (IP)**. They are often together called **TCP/IP** and are used to **format data** and **route** it through the network. **TCP** connects hosts together. If **packets** of data are not delivered it will request them again.
UDP	**User Datagram Protocol**	**UDP** also connects hosts together like TCP, except it doesn't do **error checking** so is faster but less reliable.
IP	**Internet Protocol**	Delivers packets of information from source to destination using **IP addresses** in the **packet header**.
DNS	**Domain Name System**	A naming system similar to a phone book. A **domain name**, e.g. www.adomain.com, will translate to the **IP address** 123.45.67.89
TLS/SSL	**Transport Layer Security** / **Secure Sockets Layer**	Provides an **encrypted layer** for communications to go through. TLS is a newer replacement for SSL.
HTTP/HTTPS	**HyperText Transfer Protocol** / **Secure**	Web pages are sent from the **server** to the **client** using HTTP. The full URL (web address) would be http://www.adomain.com. The **http://** here is specifying the protocol to use. https://www.adomain.com would request the web page to be delivered securely.
SMTP	**Simple Mail Transfer Protocol**	This protocol is used for the sending of **email messages**.
IMAP	**Internet Message Access Protocol**	This protocol allows email messages to be stored on a server. The client computer then has a copy of the messages. When an email is deleted it gets deleted from both the client and server, keeping all mail **synchronised**. This protocol has largely replaced POP.
FTP/SFTP	**File Transfer Protocol**	FTP is used to **send files** through the network. SFTP is the secure version. They are still used for **uploading** files and sometimes **downloading**, though much of this is now carried out through HTTP to make it easier for the user.