#### **Protocols 1**

A Level

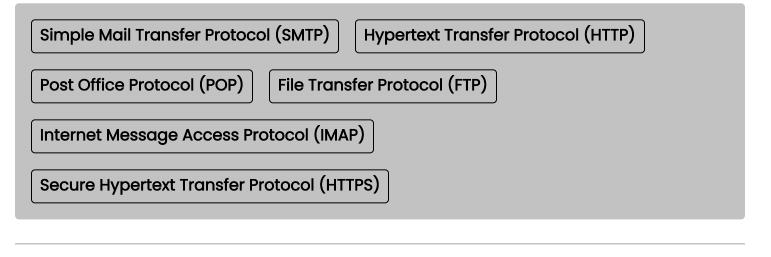


Protocols are agreed sets of rules that allow devices to communicate with each other.

The table contains descriptions of some protocols which are used on the internet. Drag and drop the name of the protocol into the table to correctly match its description.

Internet protocol	Description
	Used to access webpages and responsible for retrieving information from remote servers across the World Wide Web.
	Encapsulates all of the requested information in an encrypted data stream so that it is secure.
	Used to transfer and share files across the internet.
	Used when an email-client application wants to send an email to an email server.
	Retrieves emails from the email server. Deletes the remote copy of the email once it has been downloaded to a computer.
	Responsible for retrieving emails from email servers by email-client applications.

#### Items:



# TCP/IP stack layer protocols 6

A Level



The TCP/IP stack is a set of protocols that work together. The stack is divided up into four layers that work together in a way that allows a manufacturer or software house to focus on their own product. So long as they adhere to the necessary standards and implement the appropriate protocol(s), the component will be able to interact with the other layers to communicate effectively.

The following section provides a definition of each layer. Complete the name of each layer by dragging and dropping each term into the correct position.

	tware, for example a web browser uses HTTP, while an email client uses ide either IMAP or POP3.
destination p	layer breaks the data from the previous layer down into segments igrams (UDP). Sequence numbers are allocated, and source and ort numbers are added to the header. For TCP, delivery is acknowledged, nents are retransmitted.
The destination IP	layer prepares packets for routing across the internet. Source and addresses are added at this stage.
The path between used.	layer is responsible for moving IP packets from point to point in the n client and server. At this level, networking protocols, such as Ethernet, are
Items:	
application	transport internet (network) link (data link)





# TCP/IP stack layer protocols 7



Complete the table by dragging the correct layer or protocol into the spaces so that each protocol matches the layer at which it operates.

Application				
	TCP			
Internet				
	Ethernet			
Items:				
Transport CAT4 IP Packet HTTP Link Frame HTML Wireless				





# TCP/IP stack layer protocols 3

GCSE



The TCP/IP networking model is split into four layers. Each of these layers has a specific purpose and supports different protocols (rules for communication).

Each protocol works only on a single layer. Drag and drop the protocol into the correct position in the table.

Layer	Protocol
Application layer	
Transport layer	
Network layer (internet layer)	
Link layer (data link layer)	

Items:







# TCP/IP stack layer protocols 5





Joni is flying home for the winter holiday. She has arrived at the airport and has to scan her boarding pass. The information from the pass is encoded in a QR code and transmitted to the airport's server using secure hypertext transfer protocol (HTTPS).

Part A	Which layer 1
At which	n layer of the TCP/IP protocol stack is HTTPS initially handled?
	Internet
	Link
	Application
	Network
	Transport
	역
Part B	Difference between HTTPS and HTTP ~
What is	the difference between the protocols HTTPS and HTTP?
	The data is compressed.
	The data is encoded.
	The data is encrypted.

# When the data is received at the server it is checked against Joni's booking record. If the check is OK, a data signal is returned to the security gate to allow Joni to pass through the turnstile. Communication between the server and the gate is made using TCP (Transmission Control Protocol). At which layer of the TCP/IP protocol stack is this protocol initially handled? Transport Network Link Internet Application







## Loading a web page

**GCSE** 



Put the following statements in order, to explain what happens when you type the URL of a webpage into your browser. (Assume that none of the information is cached.)

#### **Available items**

The DNS server looks up the IP address of the server that you want.

The web server sends your computer the webpage.

Your computer sends a lookup request to the DNS server.

The DNS server sends your computer the relevant IP address.

Your computer sends a request to the web server's IP address.

You type the URL into your browser.





### Breakdown of a URL

A Level



A URL contains lots of information. Consider this URL:
https://mail.google.com/mail/u/0/#inbox
<b>Three</b> facts in the list below can be determined by studying the URL. Select the three that are correct.
google.com is a fully qualified domain name
The data exchanged between client and server will be encrypted
The request will use server port 143
The TLD is <b>com</b>
mail is a subdomain





# Specific domain name servers

A Level



Assuming that no use is made of cached data, what type of domain name server is	
responsible for getting the IP address of a web server and returning it to the client?	





#### Client-server networks 1



From the following opti	ons, select all examples	of "clients".	
An email app	on a mobile phone		
A software pro	ocess		
An end user			

In a client-server network, systems are designated as "clients" or "servers".



A web browser

A mobile phone



## Domain name server hierarchy



The domain name system is used to convert user-friendly domain names into IP addresses. The mapping from a specific domain name to a specific IP address is stored on an **authoritative name server**. This information is maintained by the person or organisation who manages the domain name.

When a domain name look-up is performed, many servers in the domain name server hierarchy may be used. Put the following steps into order so they correctly describe the look-up sequence.

#### Available items

The TLD name server is contacted and returns the details of the authoritative name server.

A server known as a recursive DNS resolver (or caching server) is contacted.

A root server is contacted and returns the details of the top level domain (TLD) name server.

If the recursive DNS resolver has the relevant IP address, it is returned to the client.

The authoritative name server is queried and returns the IP address.



