

# GCSE Computer Science

## Topic 1.3 Topologies & Protocols 3

Hey **NIC!** Meet **MAC!**



Each device on a network has a MAC Address

On each NIC is a MAC address.

The switch reads the MAC address to send the data to the right device.

- A unique identifier.
- Used by switches on LANs to direct data to the right device on a network.
- Assigned to the hardware.

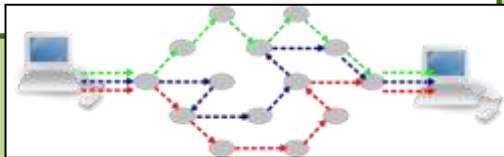


Each network has an IP Address

Between networks (over the internet) data is sent in packets and directed by routers using IP addresses.

- Used by routers on WANs.
- NOT linked to hardware.
- Can be static or dynamic.

- Packet switching is where files are split into smaller packets and are then passed from router to router to get to the desired network.
- Packet switching gets data to the destination quickly due to small file sizes, taking the fastest route.
- Packets often do not arrive in the correct order.
- The routers use the IP address to get the packets to the right network.



PROTOCOL	LAYER:	ACRONYM STANDS FOR:	FUNCTION
TCP	3	Transmission Control Protocol	Splits the data into packets before sending, then reassembles data once arrived.
IP	2	Internet Protocol	Responsible for packet switching.
HTTP	4	Hyper Text Transfer Protocol	Used by browsers to display webpages and used to transfer websites from web servers.
HTTPS	4	Hyper Text Transfer Protocol (secure)	A more secure version of HTTP (as the data, when transferred, is encrypted).
FTP	4	File Transfer Protocol	Used to transfer, access and edit files.
SMTP	4	Simple Mail transfer Protocol	Used to send emails and transfer them between mail servers.
POP3	4	Post Office Protocol (version 3)	Used to retrieve emails from a sever. <i>When they are downloaded by the user, they are deleted from the server.</i>
IMAP	4	Internet Message Access Protocol.	Used to retrieve emails from a sever. <i>Only a copy of the email is downloaded, only when the user deletes the email, is it deleted from the server.</i>

A **layer of protocols** is a group of protocols that do a similar job/ function.

4. Application Layer	3. Transport Layer	2 Network Layer	1. Link Layer
Turns data into websites, emails OR files once it has arrived.	Splits data into packets and reassembling them.	Sends data between networks. (over the internet)	Sends data in a LAN.

- ✓ The overall model is simplified by dividing it into functional parts.
- ✓ One layer can be developed or changed without affecting other layers.
- ✓ It provides a universal standard for hardware and software manufacturers to follow so their devices are able to communicate with each other.

# GCSE Computer Science - Topic 1.5 Topologies & Protocols (3)

## What I need to know:

Explain what a MAC address is needed for.			
Explain what an IP address is needed for.			
Describe the process of packet switching.			
What is included in a packet of data?			
What does TCP stand for? Which layer is it in? What is it's function?			
What does IP stand for? Which layer is it in? What is it's function?			
What does HTTP stand for? Which layer is it in? What is it's function?			
What does HTTPS stand for? Which layer is it in? What is it's function?			
What does FTP stand for? Which layer is it in? What is it's function?			
What does POP stand for? Which layer is it in? What is it's function?			
What does IMAP stand for? Which layer is it in? What is it's function?			
What does SMTP stand for? Which layer is it in? What is it's function?			
What is a layer of protocols?			
What are the names of the 4 layers?			
What is the function of each layer?			
What are the benefits of using layers?			