Cambridge IGCSE

Computer Science

Section 1

Network Hardware

Unit 3 - Hardware

MCQ Computing

Network Hardware

A network 网络 is when two or more devices are connected 连接 and able to share data.

The Internet is an example of a network, it connects millions of devices all over the world.

Network Interface Card

A computer / device needs a network interface card (NIC) to connect to a network.

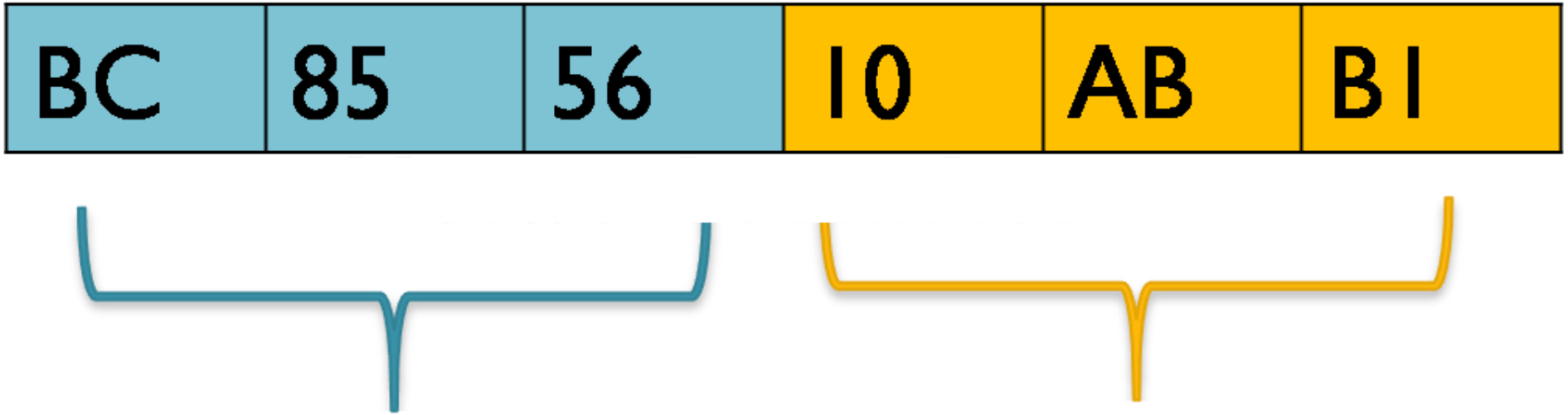
Network Interface Card

A network interface card is usually part of the device hardware. It is given a Media Access Control (MAC) address when it is manufactured. This address is unique 独特 to that card.

MAC address

A Media Access Control (MAC) address is made up of 48 bits and is usually written in hexadecimal. It has 2 parts:

Example:



IP address

An Internet Protocol (IP) address is used to identify a connection on a network, just like a postal address.

Protocols are rules or standards that must be followed to allow two devices to communicate.

Video - 5.1c IP addresses and DNS

IP address

There are two types of IP address:

IPv4

Uses 32 bits - up to 4.3 billion unique addresses
4 groups of denary, separated by dots (.)

Example: **254.25.28.77**

IPv6

Uses 128 bits - up to 340 undecillion unique addresses
8 groups of hex, separated by colons (:)

Example: **A8FB:7A88:FFF0:0FFF:3D21:2085:66FB:F0FA**

IP address

IP addresses can be static or dynamic.

A static IP address does not change and is permanently given to a device by the ISP.

Dynamic IP addresses change every time a device connects to a network.

Network Hardware

Video - 2.1 Packets, routing and reliability

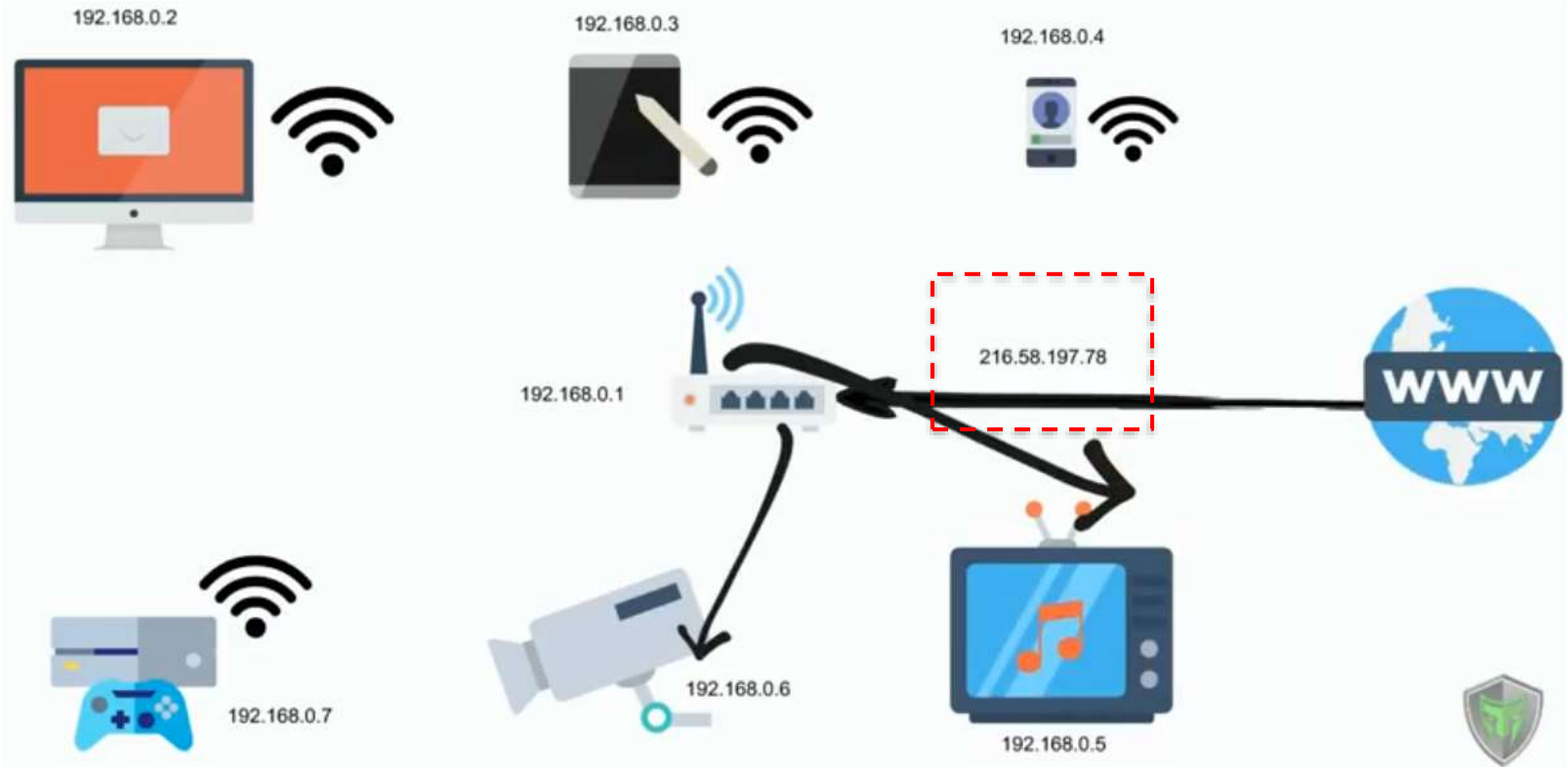
Video - 5.1b How devices communicate with a router

Routers

On a private (local 当地) network, the router gives each device on the network an IP address.

Routers

When a router connects to the internet it is given a unique public IP address by the Internet Service Provider (ISP).



Routers

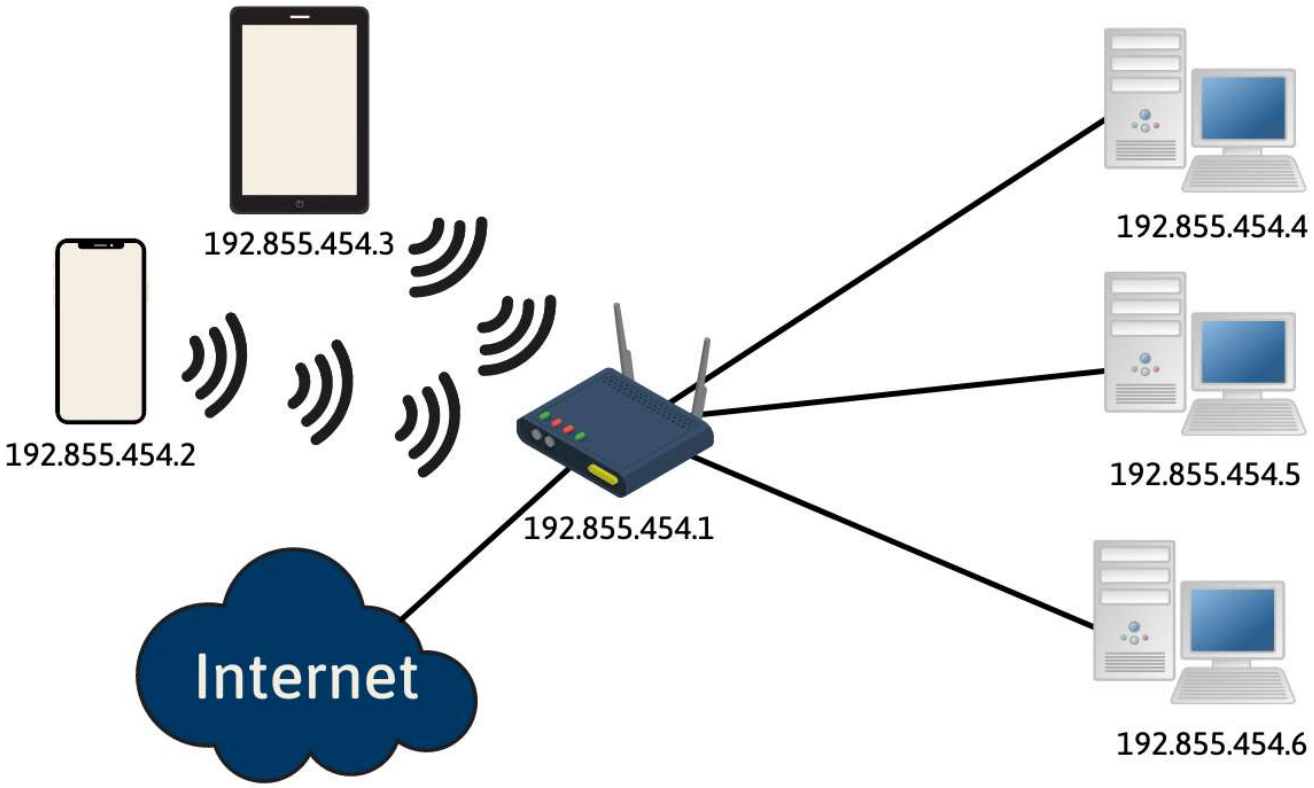
When a router connects to the internet it is given a unique public IP address by the Internet Service Provider (ISP).

*unique = no other connection on the internet has the same IP address.

All the devices connected to that router have the same public IP address as the router, but each have their own different private IP addresses on the private (local) network.

Routers

Routers enable data packets to be directed between different devices and networks.



Routers

A router can assign IP addresses and sends data to a specific destination on a network.

A router can connect a local network to the internet.

Routers usually have a modem built-in, which allows for communication over telephone or fibre optic lines.