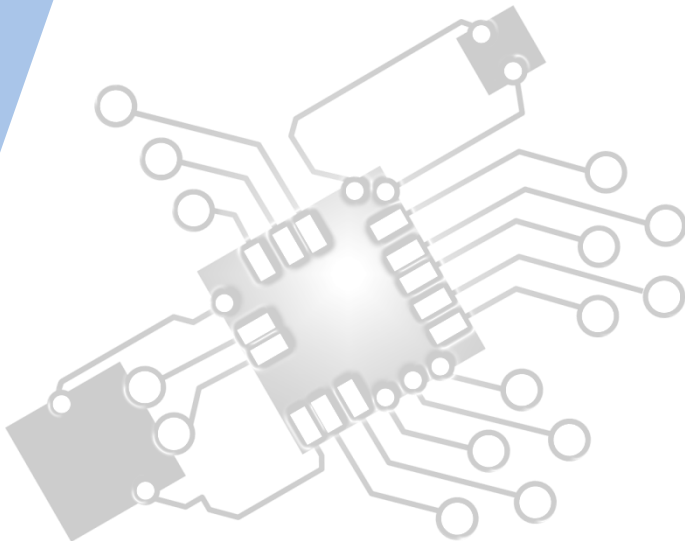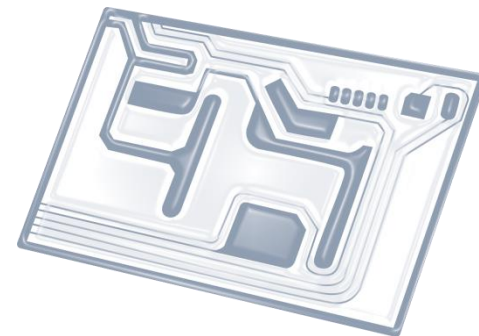# *Network fundamentals*

IB Computer Science

Content developed by
Dartford Grammar School
Computer Science Department

HL Topics 1-7, D1-4

1: System design

2: Computer Organisation

3: Networks

4: Computational thinking

5: Abstract data structures

6: Resource management

7: Control
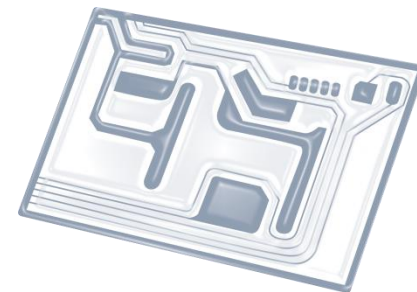
D: OOP

HL & SL 3 Overview

Network fundamentals

3.1.1 Identify different types of networks

3.1.2 Outline the importance of standards in the construction of networks

3.1.3 Describe how communication over networks is broken down into different layers

3.1.4 Identify the technologies required to provide a VPN

3.1.5 Evaluate the use of a VPN

Data transmission

3.1.6 Define the terms: protocol, data packet

3.1.7 Explain why protocols are necessary

3.1.8 Explain why the speed of data transmission across a network can vary

3.1.9 Explain why compression of data is often necessary when transmitting across a network

3.1.10 Outline the characteristics of different transmission media

3.1.11 Explain how data is transmitted by packet switching

Wireless networking

3.1.12 Outline the advantages and disadvantages of wireless networks

3.1.13 Describe the hardware and software components of a wireless network

3.1.14 Describe the characteristics of wireless networks

3.1.15 Describe the different methods of network security

3.1.16 Evaluate the advantages and disadvantages of each method of network security

# Topic 3.1.5

Evaluate the use of a VPN

VPN = Virtual Private Network

- It uses the internet to allow people to **log into a network remotely** and access its resources, but **encrypts** the connection to thwart eavesdroppers.

- If your company sets you up with a VPN, you can access your corporate intranet, file servers or email from home or a coffee shop – **just as if you were using it in your office**.

- This makes VPN a popular way to support **remote workers**, especially in fields where **privacy** is paramount, such as health care.
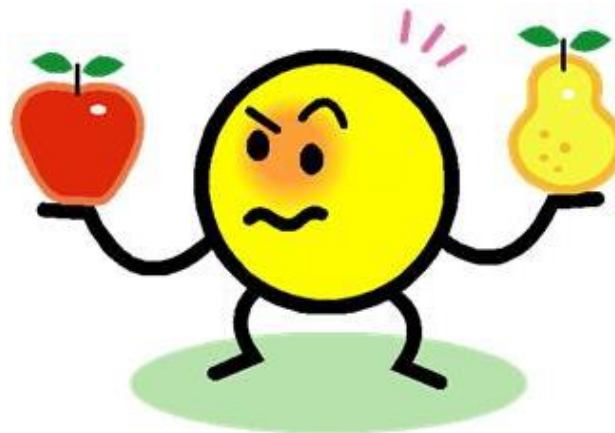
VPN
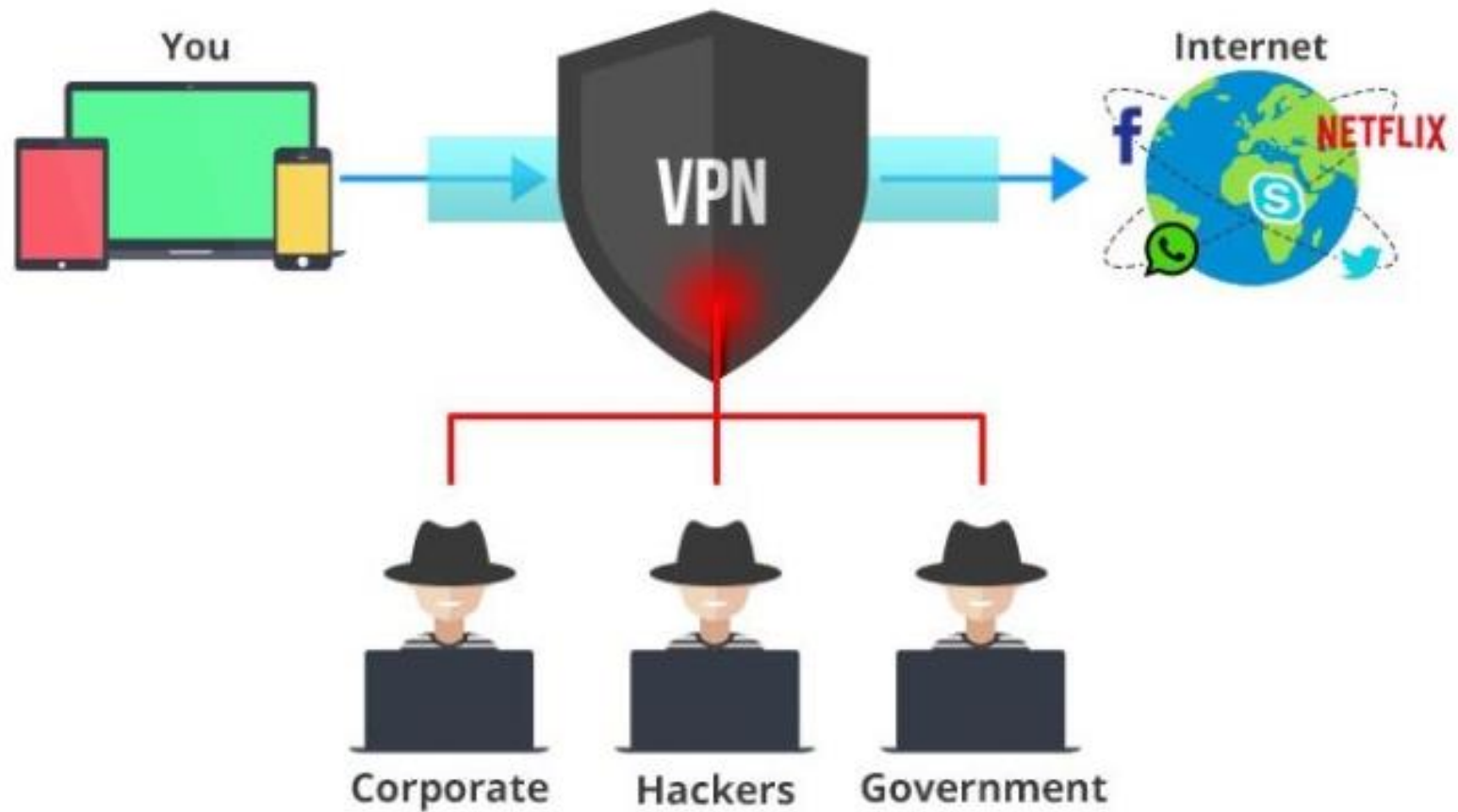
The rise of **telecommuting**

- Through a VPN, it is possible to connect to a LAN that is protected from outside access through the internet.

- Therefore, it is possible for workers to connect to a company's internal network from almost anywhere in the world.

- This gave rise to home offices, as many office jobs do not require consultation and hence can be completed from home.

- This remote working is also called **telecommuting.**

Exam note!

This curriculum point requires you to **evaluate** the different options.

That is exam speak for **knowing/discussing advantages**, **disadvantages** and for **comparing** them against one another to arrive at a conclusion.

A perspective on telecommuting

https://www.youtube.com/watch?v=R2whPdnCGrM