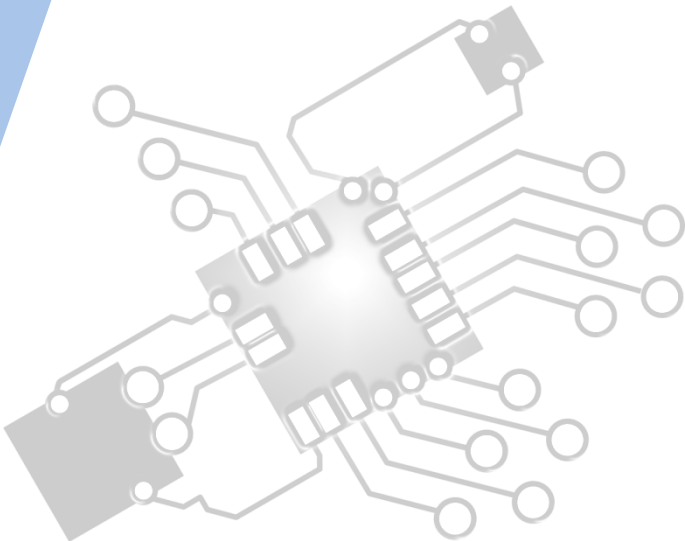




Data transmission

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



1: System design

2: Computer Organisation



3: Networks

4: Computational thinking



5: Abstract data structures

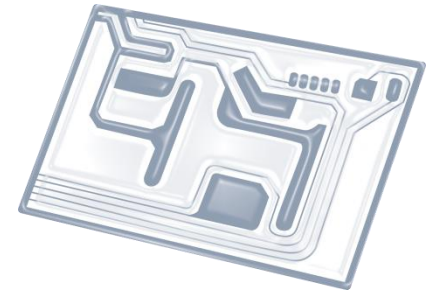
6: Resource management



7: Control

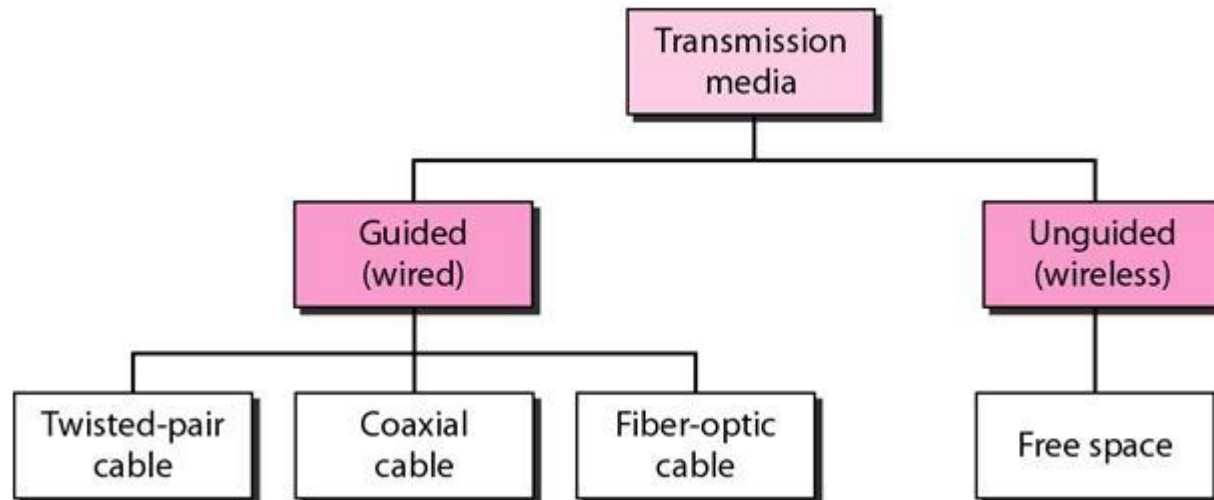
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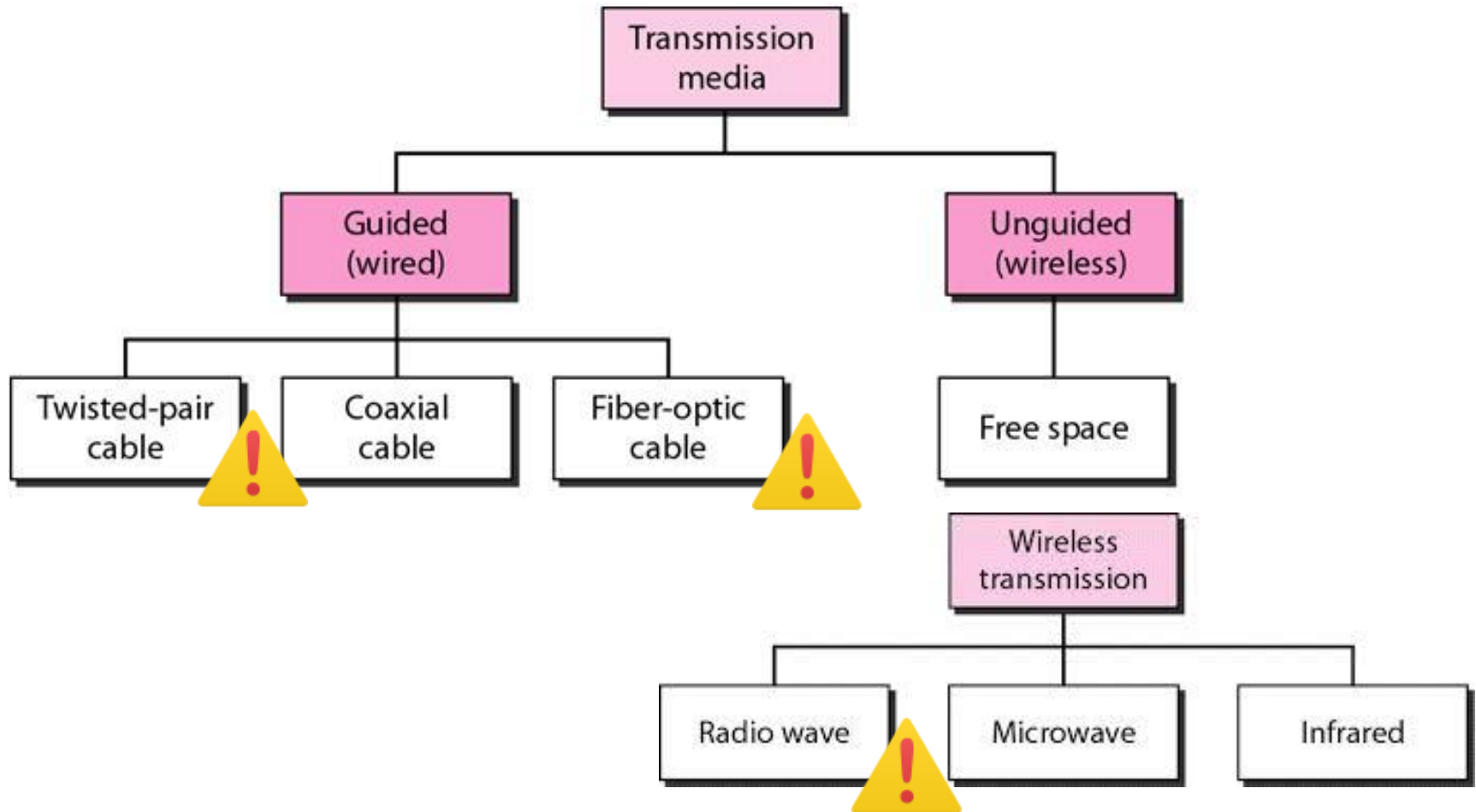


Topic 3.1.10

Outline the **characteristics** of different **transmission media**



Types of media



Characteristics of media

*We can compare
different media
types on 4
different
points:*

A large blue pyramid is positioned behind the four characteristic boxes. The pyramid is oriented with its base at the bottom and its apex at the top. The four boxes are stacked vertically on the right side of the pyramid, each containing one of the four characteristics.

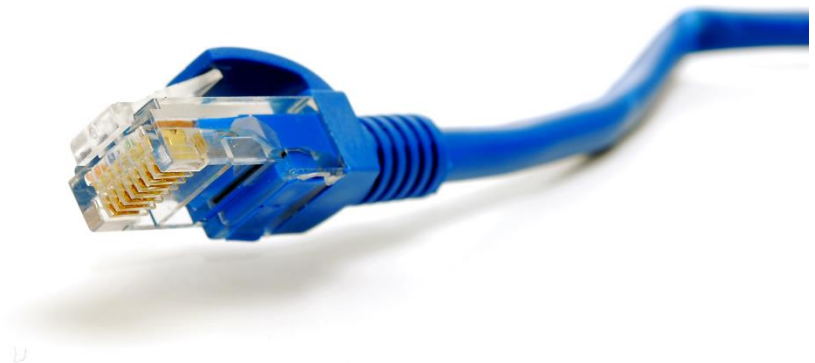
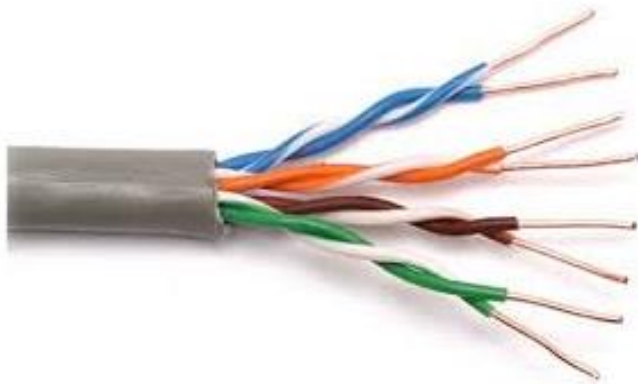
Security

Reliability

Cost

Speed

UTP – Unshielded Twisted Pair (metal)



Security

- OK security, if encrypted

Reliability

- Susceptible to EMI

Cost

- <£1 per meter

Speed

- 100Mbps – 1 Gbps

Fibre-optic (glass)



Security

- Very secure, difficult to break in

Reliability

- Generally fragile

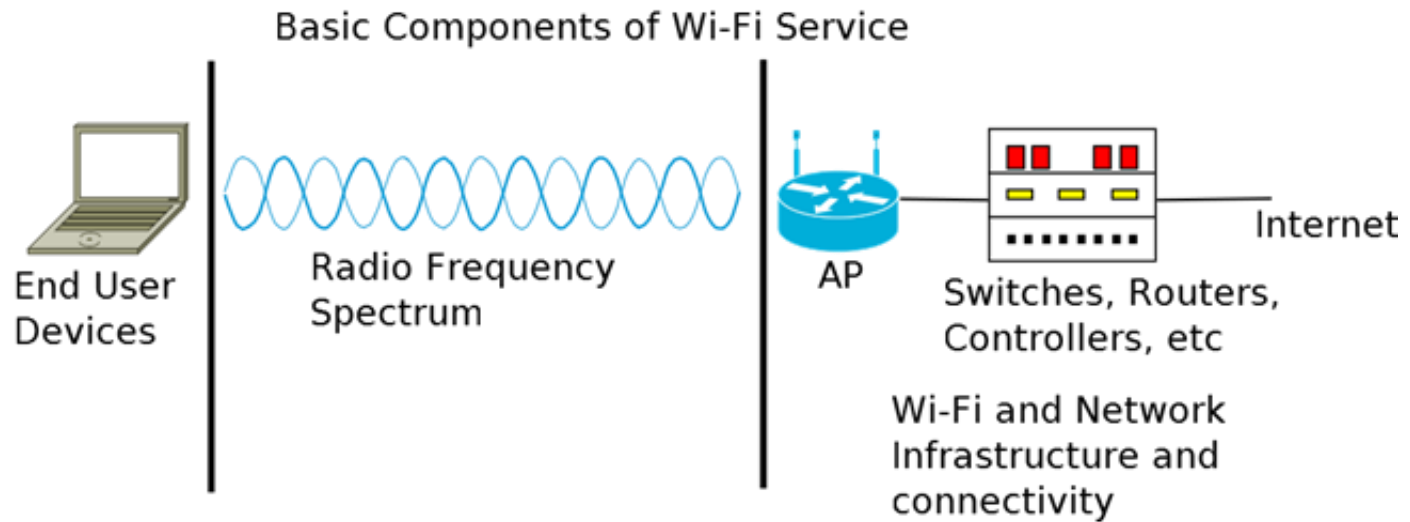
Cost

- £2-£8 per meter

Speed

- 5 – 100 Gbps

Radio waves (WLAN/Wi-Fi)



Security

- Very unsecure, unless encrypted

Reliability

- Susceptible to interference

Cost

- Technically free

Speed

- 5-200 Mbps