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
Topic 3.1.6

Define the terms: protocol & data packet
Definition: Protocol

Set of rules for data communication over a network

OR

A protocol defines the **format** and the **order** of messages exchanged between two or more communicating entities, as well as the **actions** taken on the transmission and/or receipt of a message or other event.
Definition: **Data Packet**

**Data**

Anything in a form suitable for use with a computer... such as binary. Typically data is meaningless.

**Packet**

A small unit of data used in network communication.
Make up of a data packet

Header

From: 88.93.234.8
Port: 80
To: 65.99.255.12
Port: 121

Payload

...11101101100001101110011111110000011010101110011001100110011000001111...

"I am a dangerous packet".

192.168.0.1 | youtube.com | http | 00010010101....

Source Address | Target Address | Protocol | Data...
Data packets moving