

Data Transmission

Topic	Class Notes	Organised Notes															
3.1.6 Define the terms: protocol, data packet.	- e.g. one of the ways of interpreting binary - Tells you how to translate information from one form to another form - Packet switching - data we're trying to send is broken up into small packets (chunks of data), - Over internet, it says 64kb maximum	A protocol is a universally standard set of rules that dictates how devices transfer data. A data packet is a unit of data made into a single package that travels along a given network path. Data packets are used in internet protocol transmissions for data that navigates the web and in other kinds of networks. <i>From PowerPoint:</i> Protocol - An internationally agreed set of rules to ensure transfer of data between devices. A standard protocol is one that is recognized as the standard for a specific type of transfer.															
3.1.7 Explain why protocols are necessary.	IB Question: Outline the need for protocols in network communication. - In a network, protocols are needed in order to ensure that data is read and transferred correctly and that data is delivered in the correct language, in order to make sure that the network understands it. [GOOD] - Enables data to be transferred from device to device without loss A server is a computer that receives requests from a client. Computers, printer	Protocols are needed in a network in order to enable data to be transferred from device to device without data lost. Protocols ensure that data is delivered in the correct language, which makes sure that the server understands it.															
3.1.8 Explain why the speed of data transmission across a network can vary.	3 ways of data transmission	Speed is measured in bps (bits per second) not <i>Bps (bytes per second)</i>. Time of day, distance, provider, and cable quality can affect <i>data transmission</i>. 3 ways of data transmission: Simplex: One-way, e.g. a radio broadcast Half-Duplex: Two-way but not at the same time, e.g. walkie talkie Full-Duplex: Two-way and at the same time, e.g. telephone															
3.1.9 Explain why compression of data is often necessary when transmitting across a network.	- Compression is necessary because it shortens the time it takes for a file to be transferred. It is also necessary for storing space. A file may not be able to be sent if it's too big. (e.g a video might need to be compressed to send over email) - Save time, resources, bandwidth - Because the amount of data being sent is reduced - Compression saves time and bandwidth because less data is being sent	Compression reduces the amount of data being sent, which is necessary because it saves time, resources and bandwidth due to less data being sent.															
3.1.10 Outline the characteristics of different transmission media.	- Media - means of communicating 3 ways of data transmission - WiMax - transmitted by microwave - ADSL - Digital - only 1 or 2 - Analogue can take on any value - Consider these things about transmission media: - Cost of transmission media - Maintenance - Reliability - Strength - Security - Speed (bandwidth) - Signal attenuates (degrading of signal). - Metal conductor, fibre optic, wireless - Higher cost per meter, but don't need much of it - Can't wiretap into fibreoptic - Discuss the relative merits of fibre optic versus metal cables in networks. [8 Marks]	A media is a means of communicating information. The characteristics of media are security, reliability, cost and speed. <table border="1"> <thead> <tr> <th></th><th>Metal Conductor</th><th>Fibre Optic</th></tr> </thead> <tbody> <tr> <td>Security</td><td>Can be hard to maintain because wiretapping is possible on metal wires.</td><td>Much easier to maintain than in a copper network because wire taps are practically impossible.</td></tr> <tr> <td>Reliability</td><td>Low for the signal, it is vulnerable to electromagnetic interference.</td><td>High for the signal, it is immune to electromagnetic interference.</td></tr> <tr> <td>Cost</td><td>Reasonable</td><td>Higher than copper wires</td></tr> <tr> <td>Speed</td><td>Limited</td><td>A lot higher than copper cabling, with further increases anticipated.</td></tr> </tbody> </table>		Metal Conductor	Fibre Optic	Security	Can be hard to maintain because wiretapping is possible on metal wires.	Much easier to maintain than in a copper network because wire taps are practically impossible.	Reliability	Low for the signal, it is vulnerable to electromagnetic interference.	High for the signal, it is immune to electromagnetic interference.	Cost	Reasonable	Higher than copper wires	Speed	Limited	A lot higher than copper cabling, with further increases anticipated.
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3.1.11 Explain how data is transmitted by packet switching.	Advantages of packet switching: - Full use of bandwidth - More secure - Devices of different speed can communicate easily - Resilient to communications hardware failure	Packet switching is the process by which files are broken down into smaller parts, called 'packets' in order for them to be sent with greater ease. Each packet is transmitted individually, and can take different routes to their destination. Each packet is built up of many different parts, not only the data.															