Data Exchange

By Mahinn Malik

What is Data Exchange?

Data exchange is a term used to cover all methods of passing data (including audio, video, images and text) between devices/components (computers, peripheral hardware, mobile phones, manufacturing machinery, environment monitors) and users over a network.

A example is where one network where data is exchanged is, of course, the internet, but data exchange takes place on networks of all types.

What hardware/services does VoIP require?

Any computer system that has microphone input, speaker or headphone output and a broadband connection can be used to transmit and receive voice communication using this system. The addition of a webcam will allow multimedia transmission (the simultaneous transmission of video and audio). When many users have these facilities, web meetings and conferencing can be set up.

What is a wireless network? Give some examples

- *Wireless transmission methods do not use cables.*
- *Data is transmitted through the air using electromagnetic waves.*

Examples:	What it uses:	Good and bad things:
Infrared	*uses infrared which uses light to transfer data (invisible to the human eye)*	Reliable, short range, devices must be in line of sight, can suffer from interference
Microwave	Uses short wavelengths to transmit data (invisible to human eye)	Good for longer distances, can suffer from interference from other devices
satellite	Uses satellite in space to relay data between different points on earth	Good for very long distances, very expensive

What is a wired network? Give some examples

- *Some devices are connected with the wires there are three transmission methods you need to know about.*

- *Data is exchanged over a network with cables.*

Examples:	What it uses:	Good and bad things:
UTP/STP	Unshielded twisted pair (UTP) is cable made up of pairs of copper wires twisted together. STP is the same with shielding. Shielded cable has a protective layer around the copper wires (under the plastic coating) to protect the data from interference.	Interference is lessened due to the twisting, cheaper than other methods, reliable, slow, used over short distances, susceptible to noise, which means the data can be interfered with if near another digital device or signal.
Coaxial	Solid copper wire with thick shielding.	Reliable, slow, low capacity, used over short distances, thick and physically inflexible, susceptible to noise.
Fibre optic	Glass or plastic cables which use light to transmit data.	Fast, used over long distances, little interference, expensive, complex to install(needs a specialist)

In the **data exchange** folder, open the wired and wireless word document and complete the table.

Use pages 28-29.

What are the three common modes of transmission? Give examples

- Simplex transmission: sends data in one direction only. A radio broadcast is a good example of simplex transmission.

- Half-duplex transmission: allows two-way transmissions but the devices don't transmit at the same time. A system being used to monitor and control manufacturing processes can use half-duplex transmissions. It will send a message to the control computer, which will respond with new settings, but they both cannot send messages at the same time. Some network systems use half-duplex to maximise bandwidth.

- Full duplex transmission: allows two-way communication at the same time. The telephone system, land or mobile, is an example of a full duplex system.

What is the difference between parallel and serial transmission?

- In parallel transmission, a number of bits of data are transmitted simultaneously over an equal number of wires/channels.

- *In serial transmission, bits are* transmitted one at a time over a single wire/channel.

What is USB? Give examples

- Universal serial bus (USB) is a serial transmission method which was introduced to make many of the connections to a computer look the same.

Explain client-side processing with examples

- *Client-side processing*-When the interaction between a web page and code occurs directly on a user's computer.

- A good example of a client-side interaction is a roll over (often called a mouseover), where some code is triggered when you move the mouse over a particular part of the web page. This might be something simple like the display of an advertisement, or it could be a demand for some data entry (e.g. fi lling in your details on a social networking website).

Client-Side Processing

Benefits	Disadvantages
Speed: The interaction may be faster once the code has been downloaded with the page.	It is browser specific: Not all scripts work the same way on all browsers, so you may have to create different versions depending on the browsers used.
Security: It is more secure (than server-side processing) as all the action takes place in the downloaded page and nothing comes from the browser, which could cause corruption or security problems.	Computer speed: It can be affected by the speed of your own computer. As all of the activity is taking place on a downloaded web page, the speed of the download and the speed of processing will depend on your computer system. If the processing is complex or resource hungry, it may run slowly or cause other programs to run slowly on your system.

Explain server-side processing with examples

- *Server-side processing-* When the interaction between a web page and a computer is processed through a server.

- A good example of server-side processing is the submission of a search through a search engine. The search engine matches the word or phrase against an index of website content on the web server using script.

Server-Side Processing

Benefits	Disadvantages
Efficiency: Complex code may run more efficiently, as it does not have to be downloaded on to the user's computer.	Security: The exchange of data over the network may present security risks.
Browser independent: The code is browser independent so therefore can be run on any web browser.	Overloading: A server needs to be able to cope with large volumes of users.
Speed: Performance is affected only by the speed of the web server. As all of the processing is done on the web server, the speed of your own computer is only significant for the downloading of the web pages. All of the other processing takes place on a highly resourced and speedy server.	