Basics Of Communication Over The Internet

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Adapted from a lesson i wrote for Computing In The Classroom

LO1: I will understand the basic of how data is sent over the internet

LO2: I will be able to describe the need for "rules"(protocols) when it comes to data transmission

LO3: I will understand how messages(packets) travel from one place to another

LO4: I will understand the basic structure of the Internet

Comes from "Inter-netted" meaning woven together, simply put, it is a **network of networks.**

[BASIC INTERNET DIAGRAM]

There are many different types of machines on the internet: **routers, clients and servers** are the main 3.

There are lots of technologies and protocols that govern how the internet operates, we will touch on the basics of these during the lesson.

In a basic sense, the modern internet is about sending messages and receiving responses (Client/Server model). Whether its loading a web-pages or playing a game or watching Netflix, its all about communication.

The Client Server Model

Accessing most things on the internet revolves around the idea of a Client and a Server.
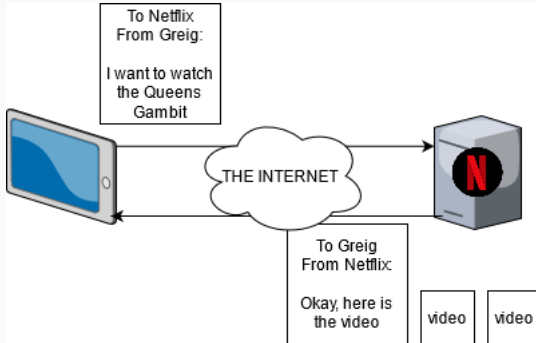
Clients request information and servers fulfil those requests

But how do we make sure that messages get to the place we want?

IP "The Internet Protocol"

The standard format that most internet messages follow is called the Internet Protocol, or IP.

You have probably heard this in the context of addresses.

IP addresses are used by routers to get information from A to B.

Messages over the internet need this IP information stuck to the front of the message so that routers can get the packet to the end and the server knows what to do with it.
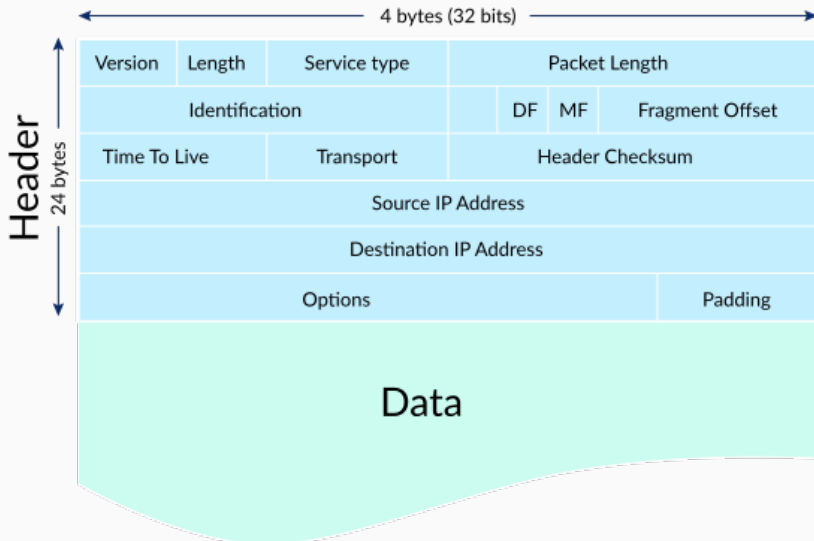
They way IP works is essentially the same as the postal system.

When you send a letter (or email) there are 3 main components to the letter:

- Address of recipient
- Sender Address
- The contents of a letter.

Take 2 minutes to think about why you need all of these things and how they might apply to IP?
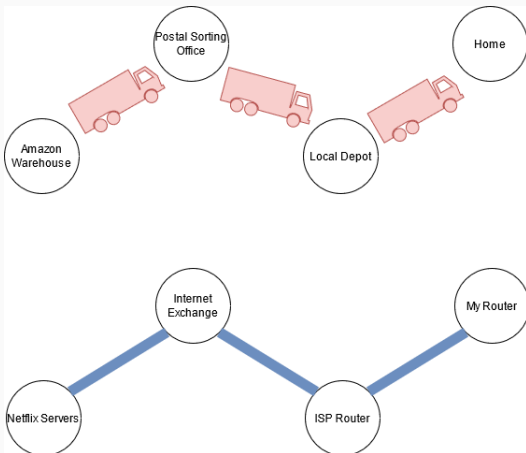
Source: Khan Academy

In the way that IP packets are like letters, the transportation system is also very similar.

NOTE: This is a vast oversimplification but is essentially how it works.

Demonstration

If you are on windows open CMD, if you are on MAC OS or Linux, open terminal.

Run the following command:

WINDOWS: *tracert metalgear.gamesoc.tardis.ed.ac.uk*
LINUX/MAC: *traceroute metalgear.gamesoc.tardis.ed.ac.uk*

This command will show you the path from your computer to that specified server, try it with other ones!