Explain how the web works?

#Simple answer:

The web works mainly between two agents : the client and the server. The clients are the web users’ connected devices such as computer, laptop, phone, etc. The servers are analogous to large storage places that store webpages, sites, or apps ; in other words they are computers with large storing capacity and store webpages, sites, and apps.

When a client device want to access a webpage , a copy of the webpage is downloaded from the server onto the client’s machine to be displayed in user’s browser. There is are requests and responds that are sent interchangeably between the client and server for this operation to be done.

There are some intermediate devices and channels that are needed in this operation such as routers , switches, hubs , fiber optics cables , and or even radio channels .

#Complex answer:

Before understanding how the web works we have to know the model that the internet is using ,its layers, and the different protocol that it uses at each level.

The model that the internet uses is called TCP/IP model. This model consists 5 layers : Application , Transport , Network , Link , and Physical layers. Each layers has its own job and contain its own protocols(set of rules). I will include the protocols that I will need in my explanation :

1)Application layer protocols : HTTP, DNS

2)Transfer layer protocol : TCP

3)Network layer protocol :IP

The components of the web

1)Clients and Servers

2)Internet Connection : the connection that allow you to send and receive the data.

3)TCP : transfer layer protocol that provides reliable transport and congestion control.

4)DNS(Domain Name System) : Like and address for a book but it is web version.

5)HTTP(Hyper Text Transfer Protocol) : a protocol that defines a language (syntax) and the meaning (semantic) for the clients and serves to speak to each others. It has 4 main types of methods:

5.1) POST method: used when the web page has a form. Used to send user input to the server.

5.2) GET method: include user data in URL field of HTTP GET request message

5.3) HEAD method: requests headers (only) that would be returned if specified URL were requested with an HTTP GET method.

5.4) PUT method: uploads new file (object) to server. And completely replaces file that exists at specified URL with content in entity body of POST HTTP request message.

There are some HTTP status code the describe the status of the response:

1)200 OK : request succeeded, requested object later in this message

2)301 Moved Permanently : requested object moved, new location specified later in this message (in Location: field)

3) 400 Bad Request : request msg not understood by server

4) 404 Not Found : requested document not found on this server

5)505 HTTP Version Not Supported

6)Component files :

6.1)Code Files: HTML , CSS, JavaScript files

6.2)Assets: images, audio, video, word documentations , PDFs , etc.

How does the web work

1. HTTP client initiates TCP connection to HTTP server (process) at a certain site on a certain port
2. HTTP server at host site waiting for TCP connection at that certain port “accepts” connection, notifying client
3. HTTP client sends HTTP request message (containing URL) into TCP connection socket. Message indicates that client wants object (The content of the webpage)
4. HTTP server receives request message, forms response message containing requested object, and sends message into its socket
5. HTTP server closes TCP connection.
6. HTTP client receives response message containing html file, displays html. Parsing html file, finds 10 referenced jpeg objects
7. Steps 1-6 repeated for each of 10 jpeg objects

The steps can be written as

1. The browser goes to the DNS server, and finds the real address of the server that the website lives on.
2. The browser sends an HTTP request message to the server, asking it to send a copy of the website to the client (you go to the shop and order your goods). This message, and all other data sent between the client and the server, is sent across your internet connection using TCP/IP.
3. If the server approves the client's request, the server sends the client a "200 OK" message, which means "Of course you can look at that website! Here it is", and then starts sending the website's files to the browser as a series of small chunks called data packets.
4. The browser assembles the small chunks into a complete web page and displays it to you