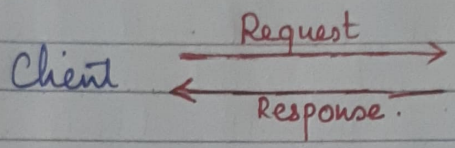
21.09.2023.

FRONTEND TECHNOLOGY

LLD - INTRO TO HTML & Web Fundamentals

- What is Internet ?
  The internet is a vast network that connects computers all over the world. Through the Internet people can share information and communicate from anywhere with an Internet connection.

- How does Internet works ?
  Internet mainly deals with two things
  • Client & • Server.
  User is the client whosoever is responding to our request is server. These two components make up the internet.



- How to reach any website's server.
  To reach a certain destination we need an address. Similarly for Internet every machine ~~has~~ query is stored.

~~To overcome the problem we do DNS Caching~~
~~The browser first use local cache of the~~
~~IP addresses.~~

DNS / Caching

has an IP address. IP (Internet protocol) address is the physical address of a particular machine. So if we want to visit any server we need to have that machine's IP address.

Since ~~we~~ are it's not possible to remember IP address, so we have DNS Server for that.

HW.
LRU Cache -

DNS : Domain Name Servers.

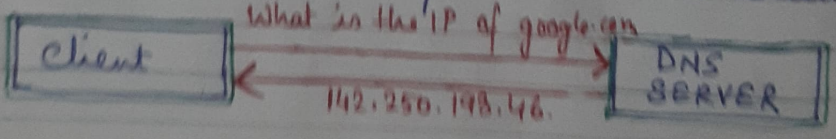
Levels of DNS Cache.

Browser level
↓
OS level
↓
Router level
↓
ISP.

Browser checks for the IP address when the request is made. Then it ask to OS if it is not in browser cache.
For the very first time it will load slow.
If the data is not present with OS it will ask to router for the IP address. From router it goes to ISP (Internet Service Provider).

DNS Server is nothing but a book which is containing information about which server is having which IP address.

So whenever the client wants to reach the server the client visits the DNS server about the IP address of that particular server just as phonebook. The DNS will return the IP address as response to the client.



Disadvantages of DNS Server architecture

- Latency • Time consuming
  i.e. DNS query is slow

VS code - Code Editor.

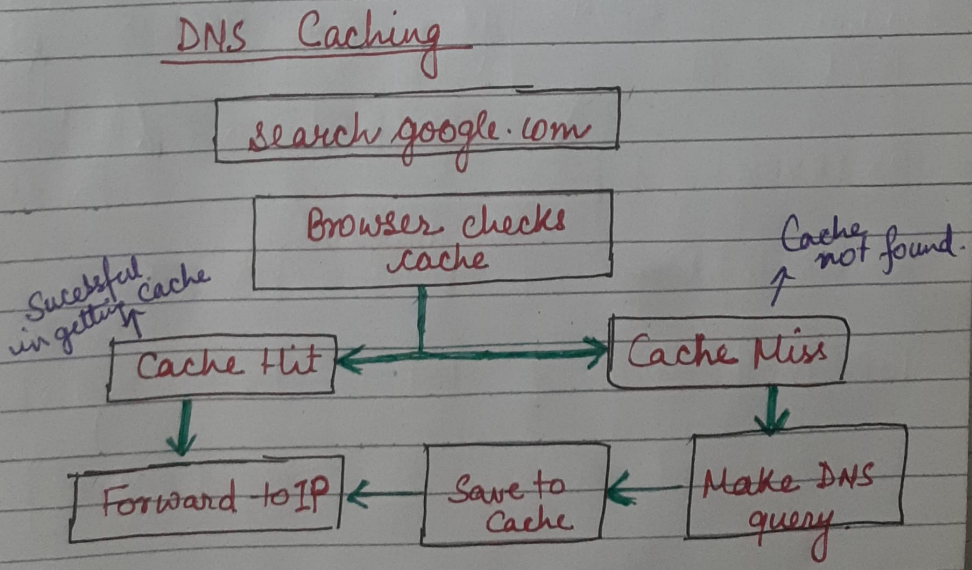
Sol^{n} to the problem:

DNS Caching is the solutions to the slow process and make the process faster.

So basically when we are setuping a new environment we have to go the DNS server which will be going to be slow but in response it will be going to return me the IP address of that particular website which the client is trying to access.

So when we get the IP address the browser is going to store it locally or cache it locally. Browser caches the IP address.

This will help in such a way that next time when the client will visit the same website instead of looking to the DNS server it will fetch the IP address from the cache of the browser.

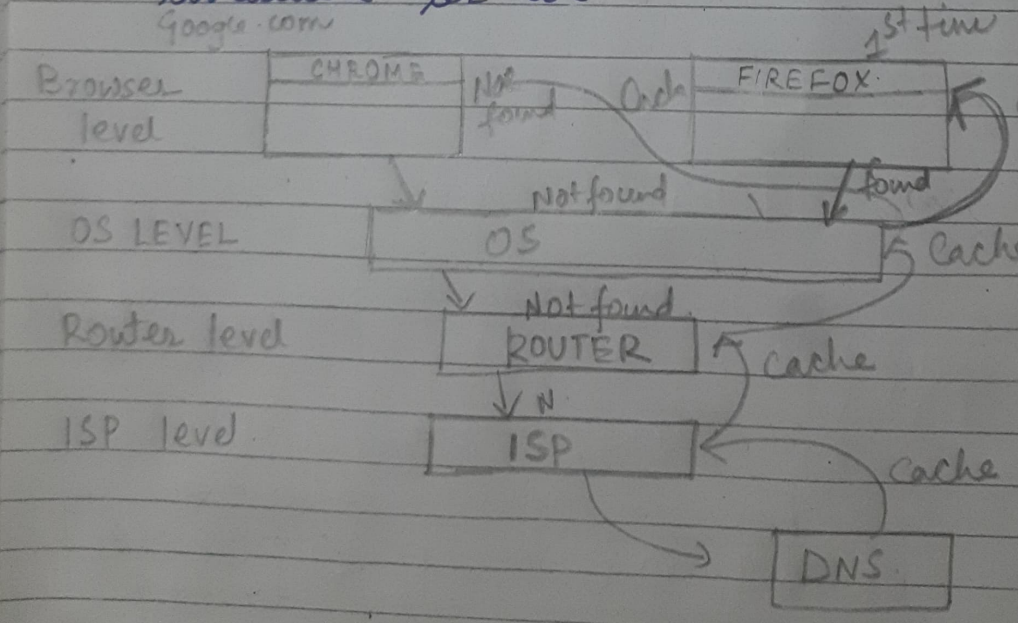


Levels of DNS Cache:

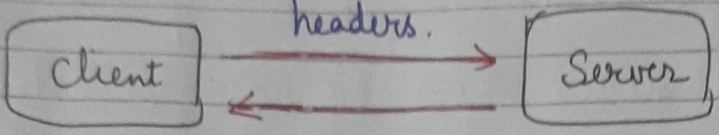
Browser level
↓
OS level
↓
Router level
↓
ISP.

When we open any website for the first time it loads really slow but from the next time onwards it becomes faster.

- Browser level cache :- Whenever we make a request, the browser will check whether it knows the IP address. So if for any reason if we are using any browser for the first time it will check whether cache is available or not. Then in that case instead of looking at DNS server which is really slow it will check at OS level whether the cache is available or not.



Since in the above example chrome has made all the request at all level hence when we are using firefox for the first time it will get the cache from the OS level only.
This is how DNS queries work.



Q. What kind of response this server can send?

A server can send any of the response → HTML, Text, File, image, video.

But we need something to identify

Client / Browser needs some mechanism to see what kind of response is coming back so that we can handle the action accordingly.

So there are headers. Headers are the extra piece of information that is send on request and response.

There are two types of headers:

- Request headers: Request headers are sent with the request.
- Response headers: Whenever we receive any information response headers are returned.

In these headers there is a special type of header called "Content type". Value of this header is "Text / HTML".

This content type says which type of response is coming back.

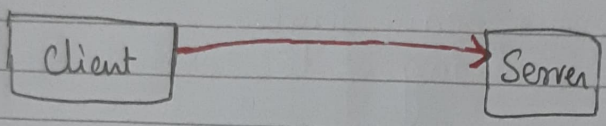
H/W: Read mozilla official docs thoroughly

TCP → Transmission Control protocol.

Protocol means how to communicate.

TCP is nothing but it's a way of talking

UDP - User datagram protocol.



100mb (big file).

This big files don't come as it is. ~~It~~ They are broken into pieces to avoid congestion.

This packets are transmitted from client-Server or Server-client via many routers installed between. So any app at the server site will send these packets in a particular route.

Sometimes the packet response from server is messed up and it reaches ~~to~~ client at random order. There comes TCP. who inspects the packets recvd from server. It takes care of that all the packets are received. Client will ask the missing packets to the server and TCP will arrange them in order. Then TCP will deliver that particular thing to clie

The advantage of TCP is there is no data loss are it is ensured that all the

packets are received and delivered properly.

So most of the request response happens on TCP because we have to make sure nothing is lost. whereas UDP is fast but it doesn't make sure the delivery. If the packets are missing it says no worries just go on to the next packet.

Mostly live streaming follow UDP.
TCP makes it slower but data should be available. Buffering or live thing UDP is used. UDP is not reliable

HTML

Hyper Text Markup language. Since it is a markup language it is used for structuring the pages.

HTML → gives structure
CSS → gives looks.
Javascript → Brain / functionality part.

.html files we store xhtml code.
HTML is a language of tags to structure our website.

<html> </html> : All the code goes inside this tag
<head> </head> : Upper Part of the browser till address bar.
<body> </body> : Rest of the website is body.

→ Properties / tags of head.
<title> </title> : Shows title of the website

→ Properties of body:
If we write something in body tag without any

Specialised tag then the sentence will be printed directly.

* It's a bad practice to write something under body without any tags.

<header> tags:

- <h1></h1> → This tag is big and bold in size
- <h2></h2> → Heading 2 smaller than h1.

Illy we have upto "h6" with which becomes smaller with each decreasing header number.

We cannot create our own tags.
If we mention some unknown tags there will be not effect as this is a markup language hence there is no compilation.

- Browser decides the tags which are in built into it.

 : Is used to dividing the page into sections. i.e. to breakdown the things into multiple boxes.

We can have multiple div tags. i.e. No. of div tags is no. of sections in the page.

 : Paragraph tag.
helps to create text in paragraph format.

<a> : Anchor tag.
helps to embed a link. It helps to navigate to other page through link which is done thru "href". So href is an attribute of <a> tag.

<abbr> : Abbreviation tag
abbr tag takes title as an attribute. So if

we hover on the word we can see a popup with the full word for the given abbreviation.

Imp tags

html, body, head, title, div, h1-h6, p, a, img, abbr, span, article, video, b, i, u, footer,

 : Bold tag → to make the text bold
 : italics tag → to make the text italics
<u></u> : Underline tag → to make the text underlined

How to make bold italics and underline at the same time?
To use multiple tags at a time we can't combine tags rather we have to make tags nested.

<img> : Image tag → for storing & displaying images
takes "src" as an attribute

Semantic tags :

Div tag we are using to divide the page into multiple sections. Which is not a good pratice to use multiple div. Basically div tag is not doing anything visually. But we should use tags with meanings and right purpose. So instead of using we will be using <section> Inside sections we can have multiple divs. Just like that we can use article tage instead of p tag to show real article.
So basically semantic tags clearly defines it's content. It makes more sense.

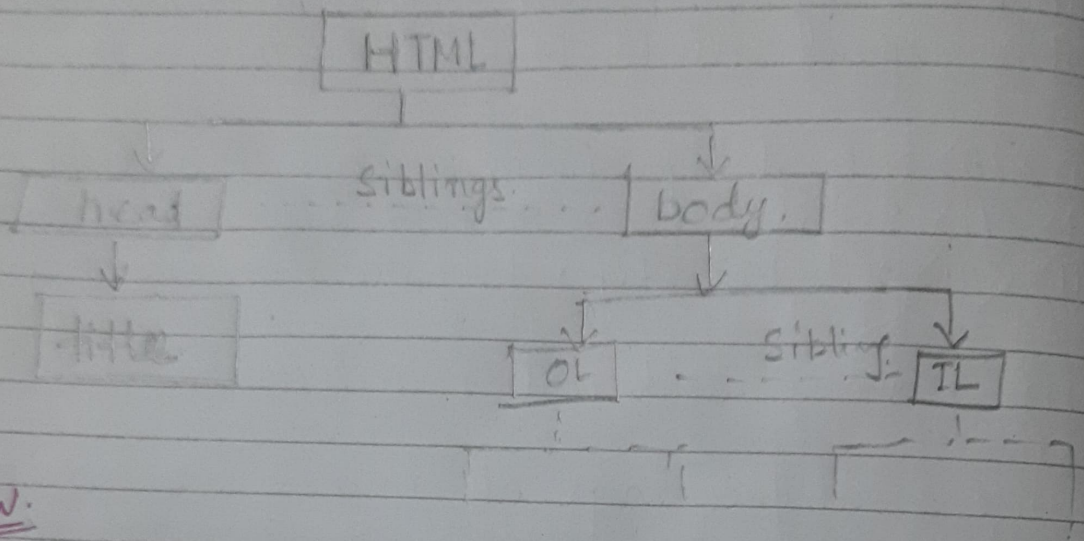
Advantages of Sg Semantic tags :

- SEO

 : Unordered list.

 : li is used for listing items under ordered / Unordered list.

 : Ordered list.



H/W.

Build a portfolio website. Online Resume.
Tell everything about urself.
i.e. Name, email, photo, hobbies, skills, contact and have to use sematic tags.

- If email is clicked, it will open the email box
- Phone number should also be clickable.
- Social links.

Every part should have relevant tags & headings