COMPUTER NETWORKS
ASSIGNMENT 1

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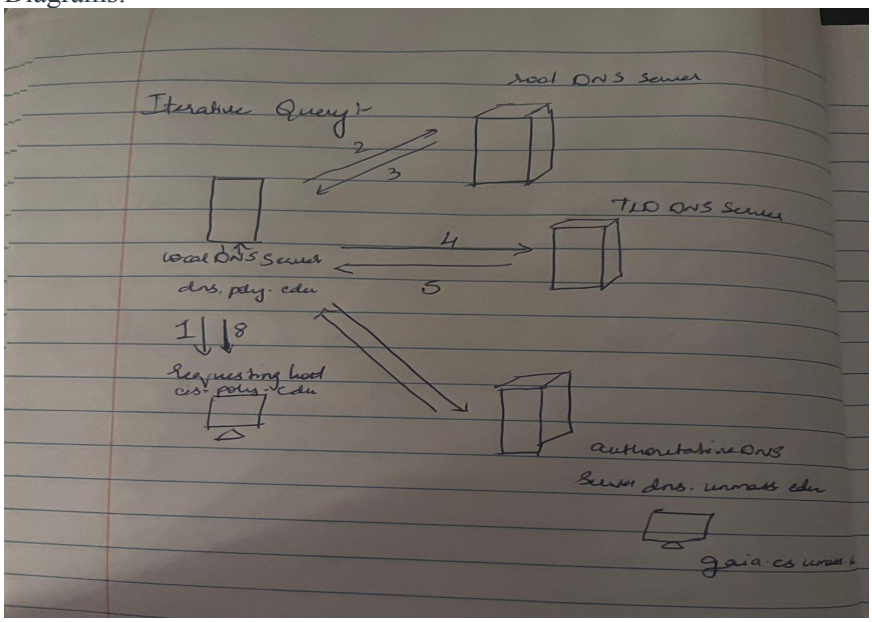
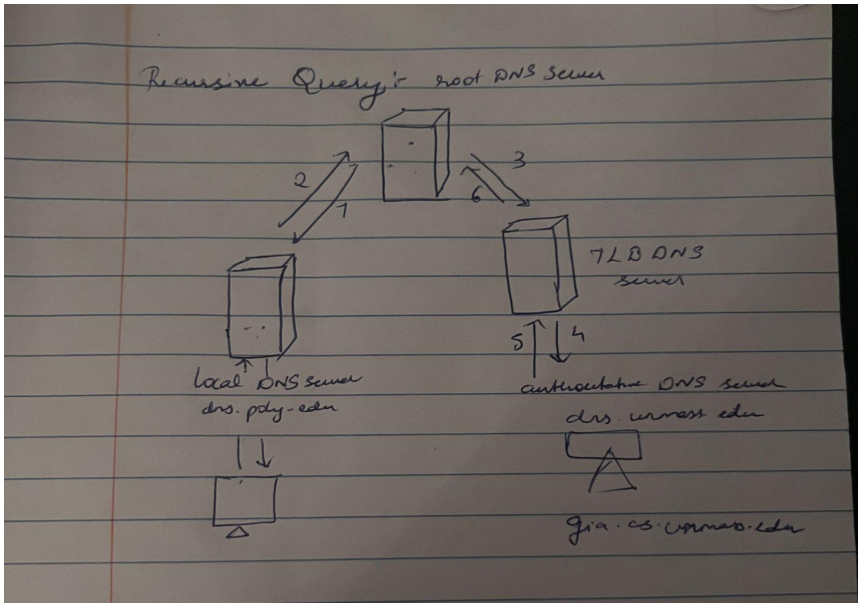
1. Differentiate iterated query and recursive query. Describe which one is better and why with an example. Depending upon scenarios, one could be preferred over the other. Include necessary diagrams if applicable.

Ans:Iterated Query: 'Iterative'the word means repetitive or when at loop.In DNS iterated query refers to something where one server communicates to mutiple servers at a time to track the IP address and also return the same to client side.It is such a query where the namesaver will not give you the answer directly but will refer you to the client.Iterated inquiries are used where the problem can be solved sequentially without the need to divide it into smaller subproblems.An iterative domain name server does not fetch complete data.
Example:The factorial of a number *n* is the product of all positive integers 1 *to n*

Recursive Query:If we have a hierarchical data or trying to resolve issues that include dynamic, nested structures recursive queries can be used.They are different from loop or a usual query.In this query records are accumilated until a repetition changes the value.
Example:
Searching across an organisational structure to discover every employee within a particular department is an example of a recursive query.
Comparision
Iterative query is preferred for a simple repetitive tasks while reursive query is used for complex hiaraecheial tasks.

Diagrams:

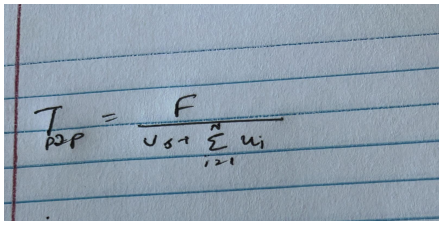




Q.2. ***Suppose that a file of size F bits needs to be distributed among N peers/clients. Compare and contrast file distribution time such that a copy of the file is received by each peer in peer-peer architecture and in client-server architecture. Discuss the necessary equation with their meaning and description.***

Ans:

In a file distribution distribution file size F bits needs to be distributes among N number of clients.The choice between both peer to peer and and client server has an impact on file distribution time.In peer to peer architecture each peer can act as both client and server,where peer shares the file amongst themselves and no central server is involved.Equation for peer to peer inloves:



In client-server architecture there is a centralised server which is responsible for distribution of files to the client.Client requests the file from server and the server sends the copies of the file to each client individually.

T2p:file distribution time.

F:size of the file in bits.

us:upload speed of the source peer(the peer that intially has the file).

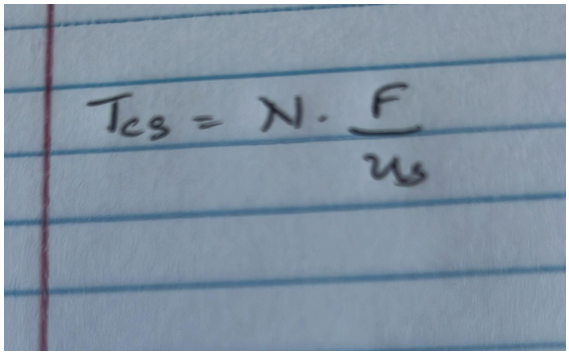
ui the upload speed of each N peer.

In p2p the distribution time depends on the upload speed of the source peer and all N receieving peers.The upload speed in the equation represents the combined capacity to distribute the file across the network.If all the peers have same or similar uplaod speed then the distribution time tendss to be more balanced.

Client Server Architecture:

In client-server architecture there is a centralised server which is responsible for distribution of files to the client.Client requests the file from server and the server sends the copies of the file to each client individually.

In a client server architecture,the file distribution can be estimated as the sum of time it takes to send the file from one server to each client.



TCS:file distribution time in client server architecture.

F:size of the file in bits.

us:upload speed of the source peer(the peer that intially has the file).

ui the upload speed of each N peer.

In a client server acrchitecture the upload speed depends on servers uplaod speed and the number of clients (peer)requesting the file The server has to send mutiple copies of each files one to each client.The distribution time tends to increase linearly with number of clients.

Comparision:
In P2P architecture the ditribution time is always dependent upon combined upload speeds of all the peers and the source peer.It can be faster if other peer have high upload speeds and distribute the load evenly.
In client server architecture,the distribution time is primarily influnced by the server's upload speed and the number of clients,increasing the number of clients can increase the distribution time linearly.
In between P2P and client server architecture depends on factors like the topology ,upload speed of peer and number of clients.P2P can be efficient when all the other peers have high uupload speed and ready to share load.Client server is less efficient compared to number of clients due to sequential distribution.

Reference:ChatGpt,
Youtube lecture:https://www.youtube.com/watch?v=-raiKzCpAjI