CS352 Project 1: Recursive DNS Client and DNS Servers

Karun Kanda (kk951), Shila Basu (sb1825)

February 19th, 2021

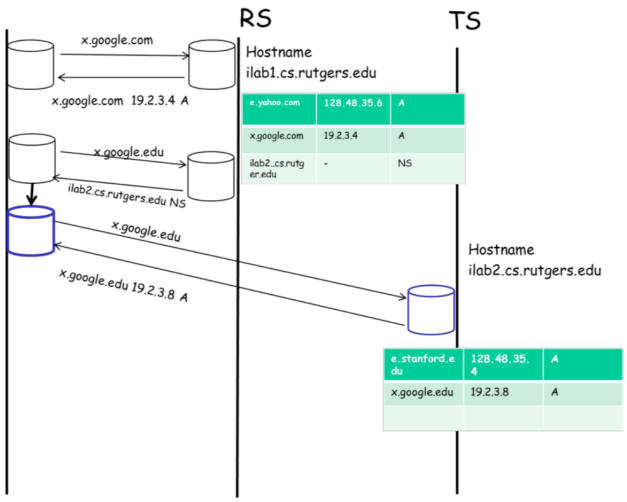
1 Questions

1.1 Please write down the full names and netids of both your team members.

Team Member 1: Karun Kanda - kk951
Team Member 2: Shila Basu - sb1825

1.2 Briefly discuss how you implemented your recursive client functionality.

We implemented our recursive client functionality by keeping the structure similar to how it was demonstrated in the given diagram.



We want to replicate the recursive query where the client (the machine we run the client application) issues queries to the RS server and TS server and the burden of name resolution is on the client's network stack. So in the application, the client first contacts the Root DNS server directly and sends a requested hostname that is looking for information about. If the requested hostname is found in the Root DNS server, the client prints out the information it receives and gives the Root Server the next request then stores it into RESOLVED.txt.

Hostname IP Address A

Otherwise the Root server reads the last line of its table which contains the hostname of the Top Level DNS Server which might have the information that the client needs.

Localhost - NS
Where localhost is the name of the TS server.

Then sends that to the client and the client connects to the Top Level DNS server. Then repeats the process but in this Top Level Server. The client sends the requested hostname to the Top Level Server and if the information is found in the Top Level Server table it sends the information and the client prints the information out and goes to the next request. Then likewise stores that into RESOLVED.txt.

Hostname IP Address A

Or the client prints an error if the information was not found in the Top Level Server either. Also still storing that into the RESOLVED.txt.

ERROR:HOST NOT FOUND

1.3 Are there known issues or functions that aren't working currently in your attached code? If so, explain.

There aren't any known issues or functions that aren't working currently in the attached code. Everything is working smoothly and as expected.

1.4 What problems did you face developing code for this project?

Some problems we faced when developing the code for this project were thinking of a good way to store the TS server and RS server tables and how to get all the hostnames from the client side into one dictionary and send it one query at a time. To solve the first issue, we ended up creating a dictionary that holds a tuple of the Hostname, IP Address and the Flag and go based on the created

tuple. Because there were only three things being placed in the tuple, it would be easy to access it based on the dictionary by array indices like **table[i][j]** where i would be the place in the dictionary We want to look at and j would be only 0-2 according to if we want the hostname, IP address and/or flag. To solve the second issue, we created a simple dictionary containing all the hostnames found in PROJI-HNS.txt then iterate through this dictionary with a queue like mechanism where we would pop one hostname from the queue at a time and send it to the RS server first.

1.5 Reflect on what you learned by working on this project.

Some key take aways we learned from this project were:

1. How DNS servers work.
2. How DNS queries work.
3. How to structure a DNS query in a client-server application.
4. How an iterative query works.
5. What the main function of a Root Name Server and a Top Level DNS Server are.