CS3041 - Assignment 3

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The goal of this assignment is to familiarize with DNS lookup and implementing a standard application layer protocol by yourself.

As discussed in the class, much can go on "under the covers," invisible to the DNS clients, as the hierarchical DNS servers communicate with each other to either recursively or iteratively resolve the client's DNS query. From the DNS client's standpoint, however, the protocol is quite simple - a query is formulated to the local DNS server and a response is received from that server.

Before starting the assignment be familiar with DNS operation and go through the RFCs (RFC 1034 and RFC 1035) to understand the content format of DNS query and response in detail. Also go through the man pages of *nslookup* to understand various options available with the tool.

1 PART1: CREATING YOUR OWN *nslookup*

You are required to implement a simple console tool to lookup the IP address(es) associated with a given domain name. The tool is required to work according to the DNS specification and protocol.

1. The tool should have a simple command line interface, similar to the *nslookup* tool.

2. Only IPv4 support is required, but feel free to implement IPv6 if you wish.

3. The DNS server and the domain should be command line arguments.

4. You are not allowed to use any helper libraries whatsoever. You must implement the protocol yourselves.

5. Your program should yield the exact same results as the nslookup tool. It should also support various options available.

6. You can find out your DNS server with (*ifconfig* (Linux) or *ipconfig /all* (Windows)).

2 PART2: DNS PROXY/CACHE

In this part of the assignment you would be creating your own DNS proxy server.

1. The DNS proxy server should forward all the queries to your local DNS server to get your domain name resolved.

2. You should do caching of your DNS resolution in your proxy server.

3. To check your DNS proxy server, set your DNS in your PC to the IP address of your DNS server.

3 SUBMISSION GUIDELINES

All the deliverable must be uploaded in the Course Web Page on Moodle as a single compressed file. The due date for submission of the assignment is Monday, Sep 21, 2015, 8:00 PM. There would be one day cut-off date for the submission. If you do late submission after the due date and before the cut-off date there would be 20% penalty in your evaluated score. After the cut-off date you would not be able to submit your assignment.

You can get your program execution evaluated by the TAs before Sep. 25, 2015 6:00 PM.

4 EVALUATION METHODOLOGY

- Correct implementation and execution of DNS Client (40)

- Correct implementation and execution of DNS Proxy / Caching (40)

- Display of proper and informative output messages (10 marks)

- Code Documentation/Comments/README file (10 marks)