Nathan Guan 3954393 Friday 12:00

CS 176A: Homework #2

a. The WHOIS database is a public database that contains the details and contacts of every domain name as well as the name server data.
b. Kevin Schmidt is the administrative contact for the UCSB network. The name of the servers are BRU-NS2.BROWN.EDU, NS1.UCSB.EDU, and NS2.UCSB.EDU. UCSB first obtained its original DNS entry in April 27, 1987. ICANN WHOIS was used to find this information.
c. Name: nba.com
Addresses: 18.191.54.162, 18.210.212.54, 18.219.105.141, 18.211.55.24
d. Yes, the UCSB web server has multiple IP addresses.
Name: fe2.edge.pantheon.io
Address: 23.185.0.2
Name: fe2.edge.pantheon.io
Address: 2620:12a:8000::2
Name: fe2.edge.pantheon.io
Address: 2620:12a:8001::2
e. csil-36 IP address: 128.111.43.56

2)a. If TCPClient is ran first, the TCP connection will not be made since the client will try to make a TCP connection with something that is not there.
b. It should run like normal since the UDPClient does not need to establish a TCP connection with the server.
c. Using different port numbers will cause the client to attempt to establish a TCP connection with incorrect processes or nonexistent processes.

3) It is not necessary to change the UDPServer.py. The port number for UDPClient is 5432 and UDPServer is 2048. Before the change, it was unspecified and 2048, respectfully.

4) a. There is a problem and it is handled at the application layer and depending on the application, the timeout values will differ and the amount of times the application will attempt to resend the DNS query will vary.

b. A machine can have multiple IP addresses even if it only has one DNS name. This may happen if the machine has multiple network interfaces.

5) It is possible for the browser to open multiple, simultaneous connections to a website. Advantages to this include reliably transferred data, lost packets will be retransmitted, and data packets are in order. Disadvantage include the slowdown of transfer when the connection is congested.

6) a) Time elapsed from when the client clicks on the link until client receives object: $2RTT_0 + RTT_1 + RTT_2 + RTT_3 + \ldots + RTTn$

b) $2RTT_0 + 2*8RTT_0 + RTT_1 + ... + RTT_n = 18RTT_0 + RTT_1 + ... + RTT_n$

c) $6RTT_0 + RTT_1 + ... + RTT_n$

d) $3RTT_0 + RTT_1 + ... + RTT_n$

Wireshark Portion

2.1)

1. The DNS query is sent over UDP.
2. The destination port of the query message is 53. The source port of the response message is 53.
3. 123.238.29.23
4. It is a type A query. It does not contain any answers.
5. No, the host does not issue new DNS queries before retrieving each image.

2.2)

1. The destination port for the DNS query message is 53 and the source port of the response message is 53.
2. The DNS query message is sent to 128.238.29.22.
3. The response contains 1 answer. The answer contains information the MIT domain name, address, type, time to live, and data length.

2.3)

1. The MIT server names include bitsy, strawb, and w20ns.

   The IP addresses can be found in the “Additional Records” tab, below “Answers”.

   bitsy IP: 18.72.0.3 strawb IP: 18.71.0.151 w20ns IP: 18.70.0.160