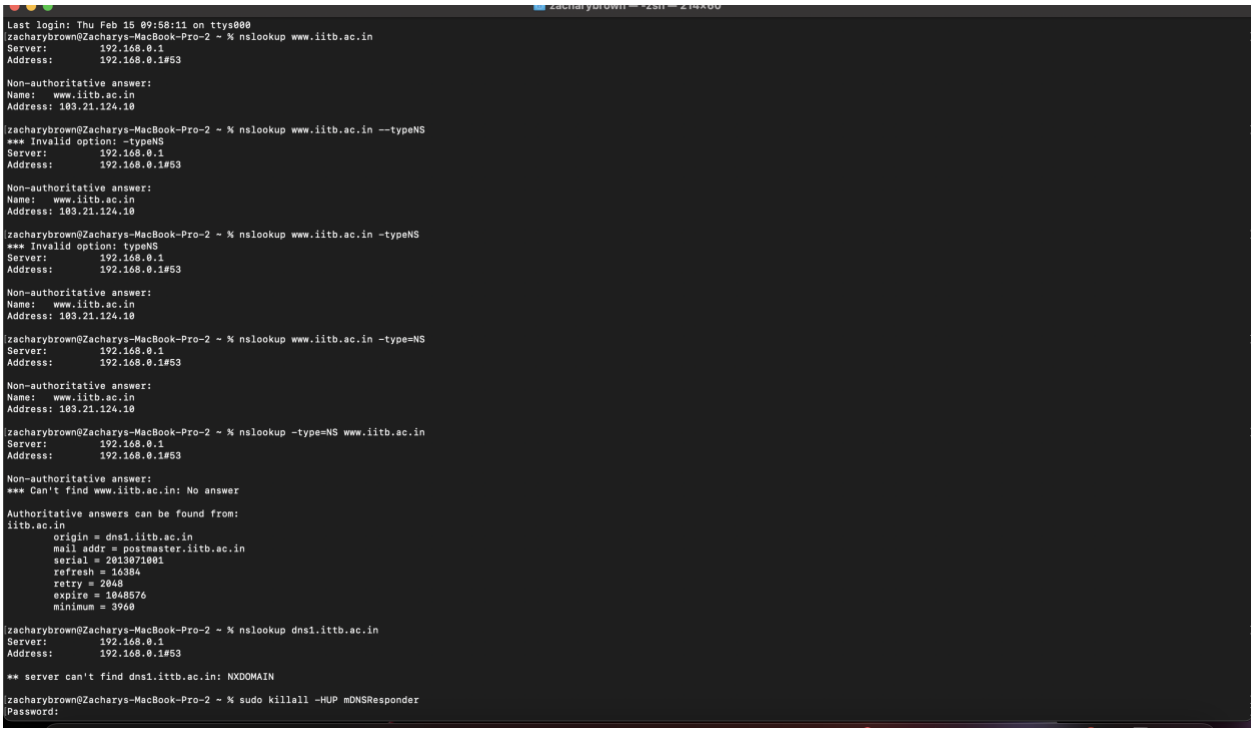
Lab-2 DNS



```
Last login: Thu Feb 15 09:58:11 on ttys000
zacharybrown@Zacharys-MacBook-Pro-2 ~ % nslookup www.iitb.ac.in
Server:         192.168.0.1
Address:        192.168.0.1#53

Non-authoritative answer:
Name:   www.iitb.ac.in
Address: 103.21.124.10

zacharybrown@Zacharys-MacBook-Pro-2 ~ % nslookup www.iitb.ac.in --typeNS
*** Invalid option: -typeNS
Server:         192.168.0.1
Address:        192.168.0.1#53

Non-authoritative answer:
Name:   www.iitb.ac.in
Address: 103.21.124.10

zacharybrown@Zacharys-MacBook-Pro-2 ~ % nslookup www.iitb.ac.in -typeNS
*** Invalid option: typeNS
Server:         192.168.0.1
Address:        192.168.0.1#53

Non-authoritative answer:
Name:   www.iitb.ac.in
Address: 103.21.124.10

zacharybrown@Zacharys-MacBook-Pro-2 ~ % nslookup www.iitb.ac.in -type=NS
Server:         192.168.0.1
Address:        192.168.0.1#53

Non-authoritative answer:
Name:   www.iitb.ac.in
Address: 103.21.124.10

zacharybrown@Zacharys-MacBook-Pro-2 ~ % nslookup -type=NS www.iitb.ac.in
Server:         192.168.0.1
Address:        192.168.0.1#53

Non-authoritative answer:
*** Can't find www.iitb.ac.in: No answer

Authoritative answers can be found from:
iitb.ac.in
        origin = dns1.iitb.ac.in
        mail addr = postmaster.iitb.ac.in
        serial = 2013071001
        refresh = 16384
        retry = 2048
        expire = 1048576
        minimum = 3960

zacharybrown@Zacharys-MacBook-Pro-2 ~ % nslookup dns1.ittb.ac.in
Server:         192.168.0.1
Address:        192.168.0.1#53

** server can't find dns1.ittb.ac.in: NXDOMAIN

zacharybrown@Zacharys-MacBook-Pro-2 ~ % sudo killall -HUP mDNSResponder
Password:
```

1. Run nslookup to obtain the IP address of the web server for the Indian Institute of Technology in Bombay, India: www.iitb.ac.in. What is the IP address of www.iitb.ac.in

   Server: 192.168.0.1
   Address: 192.168.0.1#53

   Non-authoritative answer:
   Name: www.iitb.ac.in
   Address: 103.21.124.10

2. What is the IP address of the DNS server that provided the answer to your nslookup command in question 1 above?
   a. 192.168.0.1

3. Did the answer to your nslookup command in question 1 above come from an authoritative or non-authoritative server?
   a. Non-authoritative
4. Use the nslookup command to determine the name of the authoritative name server for the iit.ac.in domain. What is that name? (If there are more than one authoritative servers, what is the name of the first authoritative server returned by nslookup)? If you had to find the IP address of that authoritative name server, how would you do so?

Authoritative answers can be found from:

iitb.ac.in

origin = dns1.iitb.ac.in

mail addr = postmaster.iitb.ac.in

serial = 2013071001

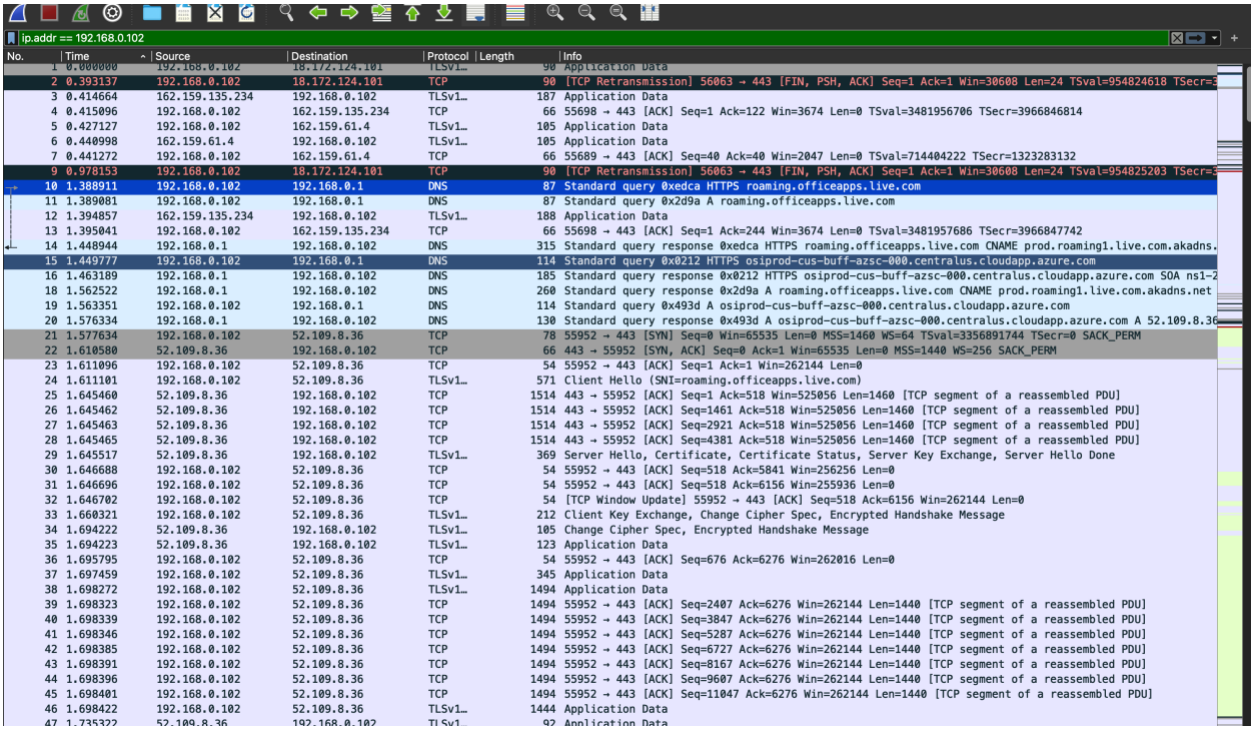
refresh = 16384

retry = 2048

expire = 1048576

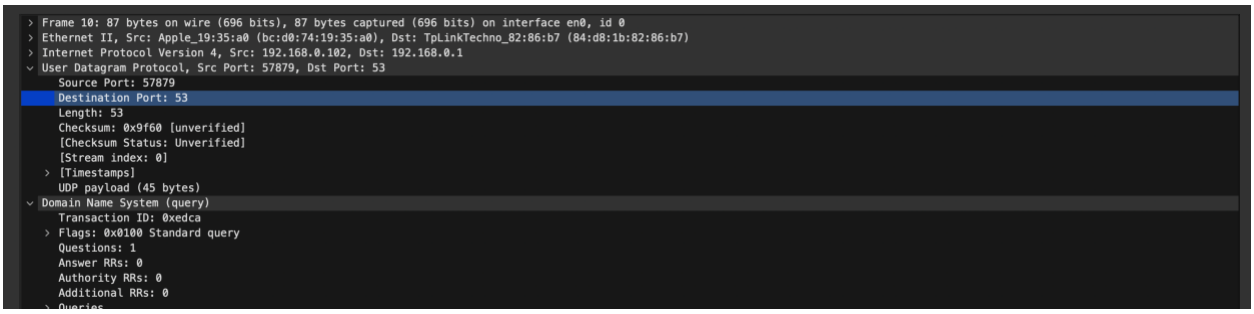
a. minimum = 3960

b. I would find the IP address by the SOA record get the primary name server and then do another nslookup with the original ip address and specify this name server



5. Locate the first DNS query message resolving the name gaia.cs.umass.edu. What is the packet number in the trace for the DNS query message? Is this query4 message sent over UDP or TCP?
    a. The message is sent over UDP

6. Now locate the corresponding DNS response to the initial DNS query. What is the packet number in the trace for the DNS response message? Is this response message received via UDP or TCP?
    a. 20, the response is received via UDP



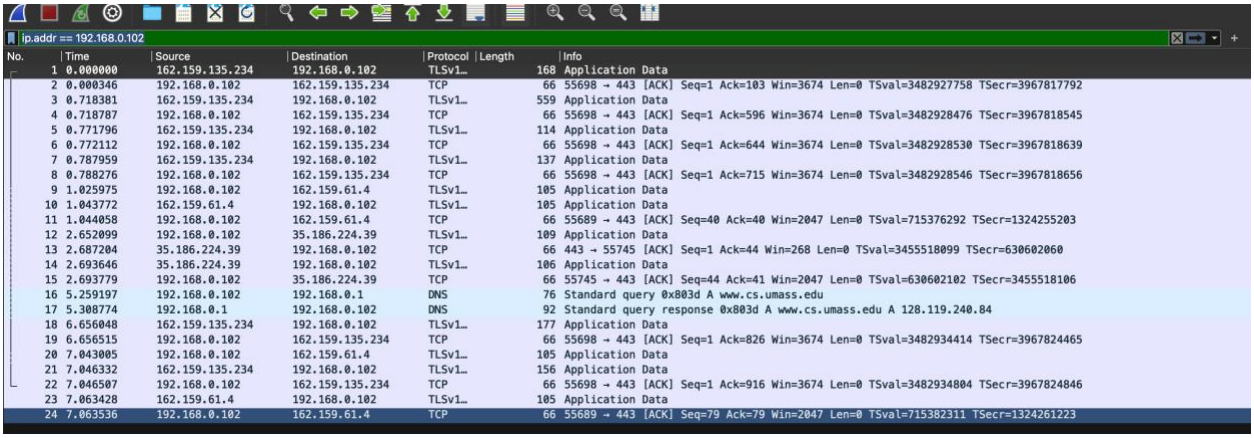
7. What is the destination port for the DNS query message? What is the source port of the DNS response message?
    a. Destination is 53, Source is 578979

8. To what IP address is the DNS query message sent?
    a. 192.168.0.1

9. Examine the DNS query message. How many "questions" does this DNS message contain? How many "answers" answers does it contain? Why?
    a. 1 Question, 0 answers. This is because it is trying to find an answer for it question.

10. Examine the DNS response message to the initial query message. How many "questions" does this DNS message contain? How many "answers" answers does it contain? Why?
    a. There is 1 question and 4 answers. This is because there were 4 different answers to the original 1 question.

11. The web page for the base file http://gaia.cs.umass.edu/kurose_ross/ references the image object http://gaia.cs.umass.edu/kurose_ross/header_graphic_book_8E_2.jpg , which, like the base webpage, is on gaia.cs.umass.edu. What is the packet number in the trace for the initial HTTP GET request for the base file http://gaia.cs.umass.edu/kurose_ross/? What is the packet number in the trace of the DNS query made to resolve gaia.cs.umass.edu so that this initial HTTP request can be sent to the gaia.cs.umass.edu IP address? What is the packet number in the trace of the received DNS response? What is the packet number in the trace for the HTTP GET request for the image object http://gaia.cs.umass.edu/kurose_ross/header_graphic_book_8E_3.jpg? What is the packet number in the DNS query made to resolve gaia.cs.umass.edu so that this second HTTP request can be sent to the gaia.cs.umass.edu IP address? Discuss how DNS caching affects the answer to this last question.
    a. Packet number 217
    b. Packet number 19
    c. Packet number 20
    d. Packet number 317
    e. Packet number 214



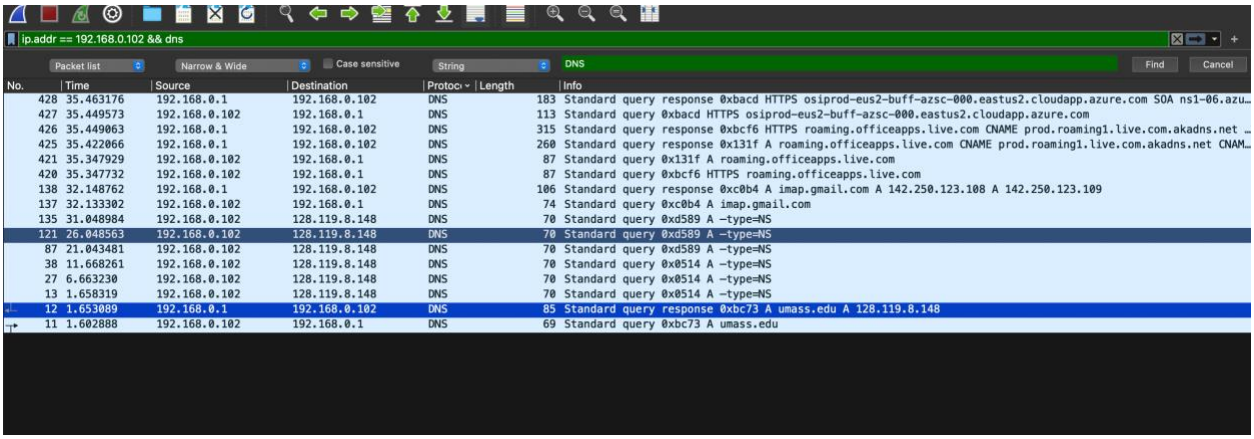
ip.addr == 192.168.0.102

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	162.159.135.234	192.168.0.102	TLSv1…	168	Application Data
2	0.000346	192.168.0.102	162.159.135.234	TCP	66	55698 → 443 [ACK] Seq=1 Ack=103 Win=3674 Len=0 TSval=3482927758 TSecr=3967817792
3	0.718381	162.159.135.234	192.168.0.102	TLSv1…	559	Application Data
4	0.718787	192.168.0.102	162.159.135.234	TCP	66	55698 → 443 [ACK] Seq=1 Ack=596 Win=3674 Len=0 TSval=3482928476 TSecr=3967818545
5	0.771796	162.159.135.234	192.168.0.102	TLSv1…	114	Application Data
6	0.772112	192.168.0.102	162.159.135.234	TCP	66	55698 → 443 [ACK] Seq=1 Ack=644 Win=3674 Len=0 TSval=3482928530 TSecr=3967818639
7	0.787959	162.159.135.234	192.168.0.102	TLSv1…	137	Application Data
8	0.788276	192.168.0.102	162.159.135.234	TCP	66	55698 → 443 [ACK] Seq=1 Ack=715 Win=3674 Len=0 TSval=3482928546 TSecr=3967818656
9	1.025975	192.168.0.102	162.159.61.4	TLSv1…	105	Application Data
10	1.043772	162.159.61.4	192.168.0.102	TLSv1…	105	Application Data
11	1.044058	192.168.0.102	162.159.61.4	TCP	66	55689 → 443 [ACK] Seq=40 Ack=40 Win=2047 Len=0 TSval=715376292 TSecr=1324255203
12	2.652099	192.168.0.102	35.186.224.39	TLSv1…	109	Application Data
13	2.687204	35.186.224.39	192.168.0.102	TCP	66	443 → 55745 [ACK] Seq=1 Ack=44 Win=268 Len=0 TSval=3455518099 TSecr=630602060
14	2.693646	35.186.224.39	192.168.0.102	TLSv1…	106	Application Data
15	2.693779	192.168.0.102	35.186.224.39	TCP	66	55745 → 443 [ACK] Seq=44 Ack=41 Win=2047 Len=0 TSval=630602102 TSecr=3455518106
16	5.259197	192.168.0.102	192.168.0.1	DNS	76	Standard query 0x803d A www.cs.umass.edu
17	5.308774	192.168.0.1	192.168.0.102	DNS	92	Standard query response 0x803d A www.cs.umass.edu A 128.119.240.84
18	6.656048	162.159.135.234	192.168.0.102	TLSv1…	177	Application Data
19	6.656515	192.168.0.102	162.159.135.234	TCP	66	55698 → 443 [ACK] Seq=1 Ack=826 Win=3674 Len=0 TSval=3482934414 TSecr=3967824465
20	7.043005	192.168.0.102	162.159.61.4	TLSv1…	105	Application Data
21	7.046332	162.159.135.234	192.168.0.102	TLSv1…	156	Application Data
22	7.046507	192.168.0.102	162.159.135.234	TCP	66	55698 → 443 [ACK] Seq=1 Ack=916 Win=3674 Len=0 TSval=3482934804 TSecr=3967824846
23	7.063428	162.159.61.4	192.168.0.102	TLSv1…	105	Application Data
24	7.063536	192.168.0.102	162.159.61.4	TCP	66	55689 → 443 [ACK] Seq=79 Ack=79 Win=2047 Len=0 TSval=715382311 TSecr=1324261223

12. What is the destination port for the DNS query message? What is the source port of the DNS response message?
    a. Source Port: 50154
    b. Destination Port: 53
13. To what IP address is the DNS query message sent? Is this the IP address of your default local DNS server?
    a. 192.168.0.1, yes this is my default local DNS server

14. Examine the DNS query message. What "Type" of DNS query is it? Does the query message contain any "answers"?
    a. The query is a standard query, it contains no answers.

15. Examine the DNS response message to the query message. How many "questions" does this DNS response message contain? How many "answers"?
    a. There is one question and one answer.



ip.addr == 192.168.0.102 && dns

Packet list | Narrow & Wide | Case sensitive | String | DNS | Find | Cancel

No.	Time	Source	Destination	Protocol	Length	Info
428	35.463176	192.168.0.1	192.168.0.102	DNS	183	Standard query response 0xbacd HTTPS osiprod-eus2-buff-azsc-000.eastus2.cloudapp.azure.com SOA ns1-06.azu…
427	35.449573	192.168.0.102	192.168.0.1	DNS	113	Standard query 0xbacd HTTPS osiprod-eus2-buff-azsc-000.eastus2.cloudapp.azure.com
426	35.449063	192.168.0.1	192.168.0.102	DNS	315	Standard query response 0xbcf6 HTTPS roaming.officeapps.live.com CNAME prod.roaming1.live.com.akadns.net …
425	35.422066	192.168.0.1	192.168.0.102	DNS	260	Standard query response 0x131f A roaming.officeapps.live.com CNAME prod.roaming1.live.com.akadns.net CNAM…
421	35.347929	192.168.0.102	192.168.0.1	DNS	87	Standard query 0x131f A roaming.officeapps.live.com
420	35.347732	192.168.0.102	192.168.0.1	DNS	87	Standard query 0xbcf6 HTTPS roaming.officeapps.live.com
138	32.148762	192.168.0.1	192.168.0.102	DNS	106	Standard query response 0xc0b4 A imap.gmail.com A 142.250.123.108 A 142.250.123.109
137	32.133302	192.168.0.102	192.168.0.1	DNS	74	Standard query 0xc0b4 A imap.gmail.com
135	31.048984	192.168.0.102	128.119.8.148	DNS	70	Standard query 0xd589 A –type=NS
121	26.048563	192.168.0.102	128.119.8.148	DNS	70	Standard query 0xd589 A –type=NS
87	21.043481	192.168.0.102	128.119.8.148	DNS	70	Standard query 0xd589 A –type=NS
38	11.668261	192.168.0.102	128.119.8.148	DNS	70	Standard query 0x0514 A –type=NS
27	6.663230	192.168.0.102	128.119.8.148	DNS	70	Standard query 0x0514 A –type=NS
13	1.658319	192.168.0.102	128.119.8.148	DNS	70	Standard query 0x0514 A –type=NS
12	1.653089	192.168.0.1	192.168.0.102	DNS	85	Standard query response 0xbc73 A umass.edu A 128.119.8.148
11	1.602888	192.168.0.102	192.168.0.1	DNS	69	Standard query 0xbc73 A umass.edu

16. To what IP address is the DNS query message sent? Is this the IP address of your default local DNS server?
    a. The IP address is 128.119.8.148, this is not the default local DNS server.
17. Examine the DNS query message. How many questions does the query have? Does the query message contain any "answers"?

a. 1 question no answers.

18. Examine the DNS response message. How many answers does the response have? If any, what information is contained in the answers? How many additional resource records are returned? What additional information is included in these additional resource records?
    a. There is no response received from umass.