WIRESHARK LAB 2

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1.

```
C:\Windows\System32>nslookup www.google.com
Server:  XiaoQiang
Address:  192.168.31.1

Non-authoritative answer:
Name:    www.google.com
Addresses:  2a00:1450:400f:804::2004
          142.250.74.132
```

Figure 1- nslookup response

When this command is run with a domain name as an argument it returns the ip address associated with the domain name. (it also returns the IPV6)

2.

```
C:\Windows\System32>nslookup -type=NS www.google.com
Server:  XiaoQiang
Address:  192.168.31.1

DNS request timed out.
    timeout was 2 seconds.
google.com
        primary name server = ns1.google.com
        responsible mail addr = dns-admin.google.com
        serial  = 539600856
        refresh = 900 (15 mins)
        retry   = 900 (15 mins)
        expire  = 1800 (30 mins)
        default TTL = 60 (1 min)
```

Figure 2- NS response

nslookup -type=NS is a command used to specifically query the DNS namespace for Name Server records. This means that the command returns information about the nameservers that serve the domain you provided in the command.

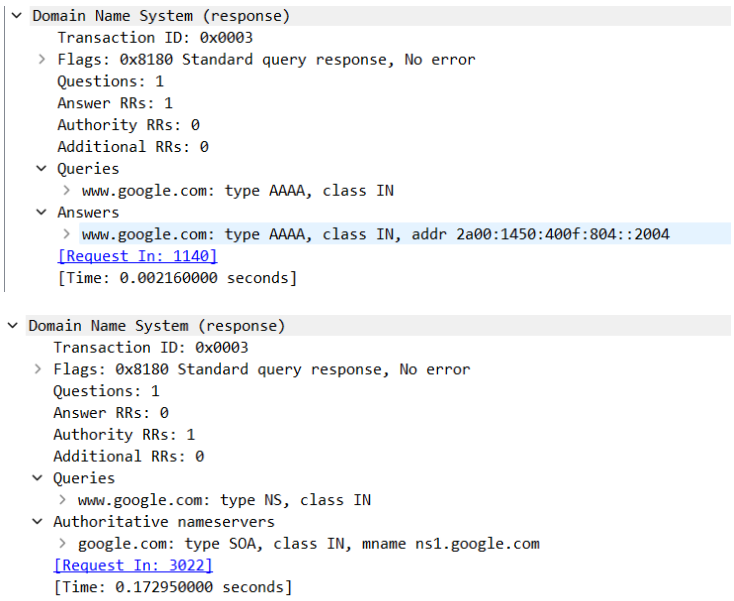
3.

1134	6.624733	192.168.31.145	192.168.31.1	DNS	85	Standard query 0x0001 PTR 1.31.168.192.in-addr.arpa
1135	6.626467	192.168.31.1	192.168.31.145	DNS	108	Standard query response 0x0001 PTR 1.31.168.192.in-addr.arpa PTR XiaoQiang
1136	6.627343	192.168.31.145	192.168.31.1	DNS	74	Standard query 0x0002 A www.google.com
1139	6.629587	192.168.31.1	192.168.31.145	DNS	90	Standard query response 0x0002 A www.google.com A 142.250.74.132
1140	6.631851	192.168.31.145	192.168.31.1	DNS	74	Standard query 0x0003 AAAA www.google.com
1142	6.634011	192.168.31.1	192.168.31.145	DNS	102	Standard query response 0x0003 AAAA www.google.com AAAA 2a00:1450:400f:804::2004
2745	16.579992	192.168.31.145	192.168.31.1	DNS	85	Standard query 0x0001 PTR 1.31.168.192.in-addr.arpa
2747	16.582919	192.168.31.1	192.168.31.145	DNS	108	Standard query response 0x0001 PTR 1.31.168.192.in-addr.arpa PTR XiaoQiang
2748	16.583918	192.168.31.145	192.168.31.1	DNS	74	Standard query 0x0002 NS www.google.com
3022	18.598613	192.168.31.145	192.168.31.1	DNS	74	Standard query 0x0003 NS www.google.com
3050	18.771563	192.168.31.1	192.168.31.145	DNS	124	Standard query response 0x0003 NS www.google.com SOA ns1.google.com

Figure 3-DN queries

In the query sequence the first query is a request and if it times out this will be sent again and after that the server will send on or more packets containing the requested information.

4.



DNS query packets contain information about the domain name being queried and the type of query being made. The query packet is sent to the DNS server and contains a query ID, flags, the domain name being queried, the type of query (e.g. A, AAAA, MX, etc.), and other optional fields like the source port and additional record types. The DNS server responds to the query with one or more packet(s) containing the requested information.

5.

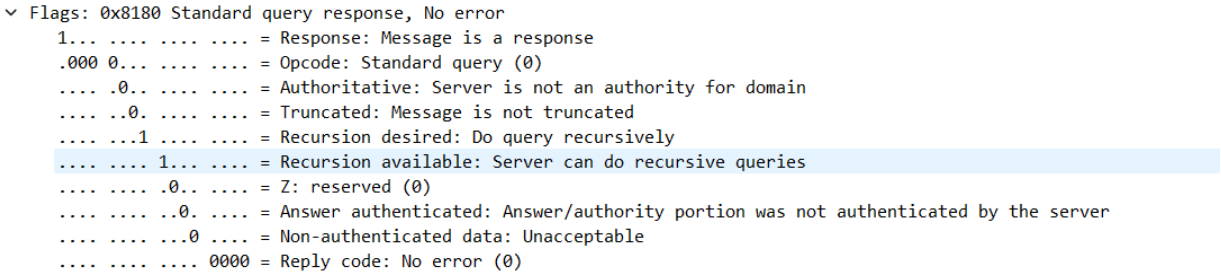


Figure 4- FLAGS

The flags contain some information about the state of the DNS response like: Type of the message, opcode, if the server is authoritative, if the message has errors and …

```
Answers
  www.google.com: type AAAA, class IN, addr 2a00:1450:400f:804::2004
      Name: www.google.com
      Type: AAAA (IPv6 Address) (28)
      Class: IN (0x0001)
      Time to live: 78 (1 minute, 18 seconds)
      Data length: 16
      AAAA Address: 2a00:1450:400f:804::2004
```

Figure 5- Answers

The answers(which are contained in A and AAAA responses) contain different fileds like Type, Class, TTL, length and address which give some information to the receiver.

6.

```
google.com: type SOA, class IN, mname ns1.google.com
    Name: google.com
    Type: SOA (Start Of a zone of Authority) (6)
    Class: IN (0x0001)
    Time to live: 60 (1 minute)
    Data length: 38
    Primary name server: ns1.google.com
```

Figure 6 - TTL

TTL is 60 seconds and it can be found in response packet(in this image it is response of the NS request)

HTTP:

1.

```
11789 4.955131    192.168.31.145    128.119.245.12    HTTP    432 GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1
12809 5.357472    128.119.245.12    192.168.31.145    HTTP   1355 HTTP/1.1 200 OK  (text/html)
12860 5.388668    192.168.31.145    128.119.245.12    HTTP    389 GET /pearson.png HTTP/1.1
13457 5.585907    192.168.31.145    128.119.245.12    HTTP    389 GET /favicon.ico HTTP/1.1
13707 5.657354    192.168.31.145    178.79.137.164    HTTP    356 GET /8E_cover_small.jpg HTTP/1.1
13850 5.761046    128.119.245.12    192.168.31.145    HTTP    754 HTTP/1.1 200 OK  (PNG)
14436 6.107040    178.79.137.164    192.168.31.145    HTTP    225 HTTP/1.1 301 Moved Permanently
14438 6.107040    128.119.245.12    192.168.31.145    HTTP    539 HTTP/1.1 404 Not Found  (text/html)
```

There are 4 get requests

First one is for the html content:

```
11789 4.955131    192.168.31.145    128.119.245.12    HTTP    432 GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1
```

Next 3 are for the images and icons (2 images and one icon):

```
12860 5.388668    192.168.31.145    128.119.245.12    HTTP    389 GET /pearson.png HTTP/1.1
13457 5.585907    192.168.31.145    128.119.245.12    HTTP    389 GET /favicon.ico HTTP/1.1
13707 5.657354    192.168.31.145    178.79.137.164    HTTP    356 GET /8E_cover_small.jpg HTTP/1.1
```

2.

The response to the text request is like below(it is contained in line-based text):

```
Line-based text data: text/html (23 lines)
    <html>\n
    <head>\n
    <title>Lab2-4 file: Embedded URLs</title>\n
    <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">\n
    </head>\n
    \n
    <body bgcolor="#FFFFFF" text="#000000">\n
    \n
    <p>\n
    <img src="http://gaia.cs.umass.edu/pearson.png" WIDTH="140" HEIGHT="82" > </p>\n
    <p>This little HTML file is being served by gaia.cs.umass.edu. \n
    It contains two embedded images. The image above, also served from the \n
    gaia.cs.umass.edu web site, is the logo of our publisher, Pearson. \n
    The image of our 8th edition book cover below is stored at, and served from,\n
      a  WWW server kurose.cslash.net in France:</p>\n
    <p align="left"><img src="http://kurose.cslash.net/8E_cover_small.jpg"\n
    \t\t     width="168" height="220"></p>\n
    And while we have your attention, you might want to take time to check out the\n
    \t\t     available open resources for this book at\n
    \t\t     <a href="http://gaia.cs.umass.edu/kurose_ross"> http://gaia.cs.umass.edu/kurose_ross</a>.\n
    \n
    </body>\n
    </html>\n
```

The content of the png file is as below(Portable Network Graphics):

```
Portable Network Graphics
    PNG Signature: 89504e470d0a1a0a
  Image Header (IHDR)
      Len: 13
      Chunk: IHDR
      ..0. .... .... .... .... .... .... .... = Ancillary: This is a CRITICAL chunk
      .... .... ..0. .... .... .... .... .... = Private: This is a PUBLIC chunk
      .... .... .... .... .... .... ..0. .... = Safe To Copy: This chunk is NOT safe to copy
      Width: 253
      Height: 199
      Bit Depth: 8
      Colour Type: Indexed-colour (3)
      Compression Method: Deflate (0)
      Filter Method: Adaptive (0)
      Interlace Method: No interlace (0)
      CRC: 0xe50aa505
  Palette (PLTE)
  Image data chunk (IDAT)
  Image Trailer (IEND)
```

The other Get requests got either moved permanently or not found: