

CSE 3300 - Homework 2

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Question 1

Total time elapsed from click to object receipt:

$$= 2 \cdot RTT_0 + RTT_1 + RTT_2 + \dots RTT_n$$

Question 2

a) 1 HTML File + 8 other small objects = 9 total files, over non-persistent:

$$\begin{aligned} &= 9 \cdot 2 \cdot RTT_0 + RTT_1 + RTT_2 + \dots RTT_n \\ &= 18 \cdot RTT_0 + RTT_1 + RTT_2 + \dots RTT_n \end{aligned}$$

b) 1 HTML + 8 other small objects = 9 total files, over non-persistent with 5 parallel connections. But HTML has to be retrieved first, so 2RTT (for HTML) + 2*2RTT (two lots of parallel connections for the objects).

$$\begin{aligned} &= 2 \cdot RTT_0 + 2 \cdot 2 \cdot RTT_0 + RTT_1 + RTT_2 + \dots RTT_n \\ &= 6 \cdot RTT_0 + RTT_1 + RTT_2 + \dots RTT_n \end{aligned}$$

c) 1 HTML + 8 other small objects = 9 objects over persistent HTTP. 2RTT to set up the connection. 2RTT to set up the persistent connection, 1RTT for HTML + 1RTT for all referenced objects.

$$\begin{aligned} &= 2 \cdot RTT_0 + RTT_0 + RTT_0 + RTT_1 + RTT_2 + \dots + RTT_n \\ &= 4 \cdot RTT_0 + RTT_1 + RTT_2 + \dots RTT_n \end{aligned}$$

Question 3

a)

1. a.root-servers.net
2. e.root-servers.net
3. a.edu-servers.net
4. msb-cache.net.uconn.edu

b)

google.com:

1. a.root-servers.net
2. l.root-servers.net
3. b.gtld-servers.net
4. ns2.google.com

yahoo.com:

1. a.root-servers.net
2. c.root-servers.net
3. l.gtld-servers.net
4. ns3.yahoo.com

amazon.com:

1. a.root-servers.net
2. g.root-servers.net
3. b.gtld-servers.net
4. ns3.p31.dynect.net

Question 4

MAIL FROM: is the return address, for contact purposes.

FROM: is the sender, or author of the message.

It is useful to think of the analogy with regular mail, where the return address (or sender) provided on the reverse of the envelope's exterior (MAIL FROM) may differ from the actual author of the letter inside the envelope (FROM).

Question 5

Number of two-second chunks:

$$\frac{10 \cdot 60}{2} = 300$$

Multiplied by number of quality levels:

$$300 \cdot 6 = 1800$$

Therefore there are 1800 URLs required for one ten minute video provided at six quality levels.

HTTP Wireshark Lab

1. The Basic HTTP GET/response interaction.

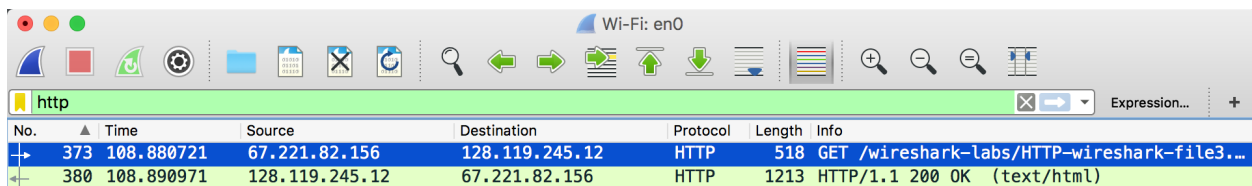
- 1) My Browser is using HTTP version 1.1. The server is also using HTTP version 1.1.
- 2) Accept-Language: en-GB, en-US (i.e. British and American English).
- 3) My IP: 67.221.82.156; gaia.cs.umass.edu: 128.119.245.12.
- 4) Status code returned: 200 (OK).
- 5) Last-Modified: Mon, 26 Feb 2018 06:59:01 GMT.
- 6) 552 bytes
- 7) Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.10 Perl/v5.16.3

2. The HTTP Conditional GET/response interaction:

- 8) The first HTTP/GET request does not have an IF-MODIFIED-SINCE line.
- 9) The server did return the contents in a field called 'Line-based text data: text/html'. The size of the response is also larger than the cached version (796 vs 306 bytes).
- 10) If-Modified-Since: Tue, 27 Feb 2018 06:22:02 GMT
- 11) HTTP Response Code: 304 (Not Modified). The server did not explicitly return the contents of the text file as the field described above was not included and the response was significantly smaller than the previous response (see 9, above).

3. Retrieving Long Documents

- 12) My browser sent one single GET request message. The first HTTP packet in the trace (#373) contains the GET message for the Bill of Rights.
- 13) The response code and phrase were sent back in the second HTTP packet in the trace (#380).
- 14) The status code return was 200 (phrase: OK).
- 15) Four TCP packets were required to transmit the response and the text of the bill of rights.



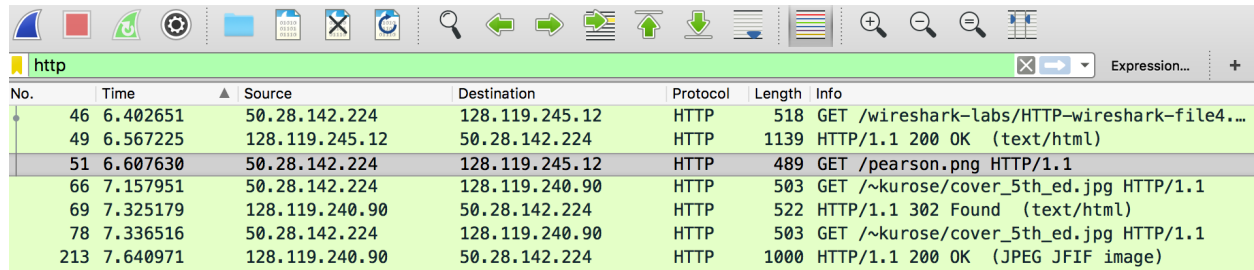
The image shows a Wireshark packet capture window. The top toolbar includes icons for file operations, network analysis, and search. The packet list pane shows two packets: packet 373 (GET request) and packet 380 (200 OK response). The packet details pane for packet 380 shows the HTTP response structure, including the status line 'HTTP/1.1 200 OK (text/html)'.

No.	Time	Source	Destination	Protocol	Length	Info
373	108.880721	67.221.82.156	128.119.245.12	HTTP	518	GET /wireshark-labs/HTTP-wireshark-file3...
380	108.890971	128.119.245.12	67.221.82.156	HTTP	1213	HTTP/1.1 200 OK (text/html)

4. HTML Documents with Embedded Objects

- 16) My browser sent four GET requests to:
 - 128.119.245.12 (original HTML page)
 - 128.119.245.12 (pearson.png)
 - 128.119.240.90 (cover_5th_ed.jpg)
 - 128.119.240.90 (cover_5th_ed.jpg - after 302 redirect)

17) The two requests were sent in parallel as both requests were sent before either of the responses had been received. There was one complicating factor in that the textbook cover image had been moved and required a 302 redirect to be found (necessitating another GET request).

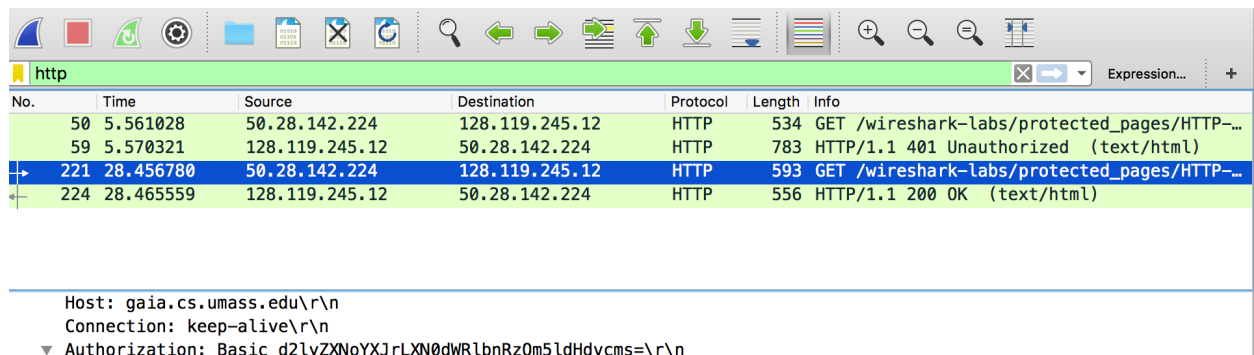


No.	Time	Source	Destination	Protocol	Length	Info
46	6.402651	50.28.142.224	128.119.245.12	HTTP	518	GET /wireshark-labs/HTTP-wireshark-file4...
49	6.567225	128.119.245.12	50.28.142.224	HTTP	1139	HTTP/1.1 200 OK (text/html)
51	6.607630	50.28.142.224	128.119.245.12	HTTP	489	GET /pearson.png HTTP/1.1
66	7.157951	50.28.142.224	128.119.240.90	HTTP	503	GET /~kurose/cover_5th_ed.jpg HTTP/1.1
69	7.325179	128.119.240.90	50.28.142.224	HTTP	522	HTTP/1.1 302 Found (text/html)
78	7.336516	50.28.142.224	128.119.240.90	HTTP	503	GET /~kurose/cover_5th_ed.jpg HTTP/1.1
213	7.640971	128.119.240.90	50.28.142.224	HTTP	1000	HTTP/1.1 200 OK (JPEG JFIF image)

5. HTTP Authentication

18) The initial response from the server was 401 (Unauthorized).

19) Authorization: Basic d2lyZXNoYXJrLXN0dWRlbnRzOm5ldHdvcms (Credentials: wireshark-students:network)

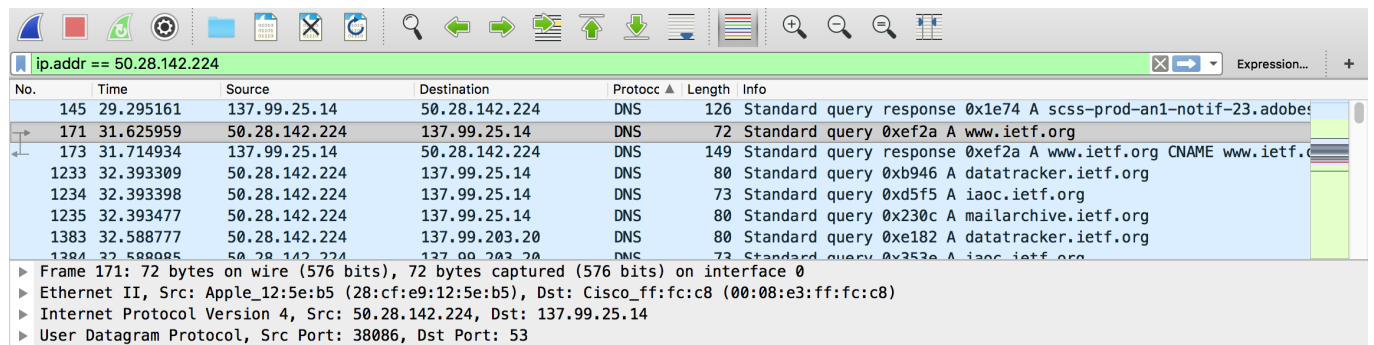


No.	Time	Source	Destination	Protocol	Length	Info
50	5.561028	50.28.142.224	128.119.245.12	HTTP	534	GET /wireshark-labs/protected_pages/HTTP-...
59	5.570321	128.119.245.12	50.28.142.224	HTTP	783	HTTP/1.1 401 Unauthorized (text/html)
221	28.456780	50.28.142.224	128.119.245.12	HTTP	593	GET /wireshark-labs/protected_pages/HTTP-...
224	28.465559	128.119.245.12	50.28.142.224	HTTP	556	HTTP/1.1 200 OK (text/html)

Host: gaia.cs.umass.edu\r\n
Connection: keep-alive\r\n
▼ Authorization: Basic d2lyZXNoYXJrLXN0dWRlbnRzOm5ldHdvcms=\r\n

DNS Wireshark Lab

- 1) www.boj.or.jp : 104.97.120.139
- 2) www.ed.ac.uk : Nameserver = dns0.ed.ac.uk
- 3) nslookup mail.yahoo.com dns0.ed.ac.uk -> 87.248.114.11 (fd-geoycpi-uno.gycpi.b.yahoodns.net)
- 4) The DNS requests were sent using UDP, as can be seen at the bottom of the image below.



No.	Time	Source	Destination	Protocol	Length	Info
145	29.295161	137.99.25.14	50.28.142.224	DNS	126	Standard query response 0x1e74 A scss-prod-an1-notif-23.adobe
171	31.625959	50.28.142.224	137.99.25.14	DNS	72	Standard query 0xef2a A www.ietf.org
173	31.714934	137.99.25.14	50.28.142.224	DNS	149	Standard query response 0xef2a A www.ietf.org CNAME www.ietf.org
1233	32.393309	50.28.142.224	137.99.25.14	DNS	80	Standard query 0xb946 A datatracker.ietf.org
1234	32.393398	50.28.142.224	137.99.25.14	DNS	73	Standard query 0xd5f5 A iaoc.ietf.org
1235	32.393477	50.28.142.224	137.99.25.14	DNS	80	Standard query 0x230c A mailarchive.ietf.org
1383	32.588777	50.28.142.224	137.99.203.20	DNS	80	Standard query 0xe182 A datatracker.ietf.org
1384	32.588885	50.28.142.224	137.99.203.20	DNS	73	Standard query 0x353e A iaoc.ietf.org

Frame 171: 72 bytes on wire (576 bits), 72 bytes captured (576 bits) on interface 0
Ethernet II, Src: Apple_12:5e:b5 (28:cf:e9:12:5e:b5), Dst: Cisco_ff:fc:c8 (00:08:e3:ff:fc:c8)
Internet Protocol Version 4, Src: 50.28.142.224, Dst: 137.99.25.14
User Datagram Protocol, Src Port: 38086, Dst Port: 53

- 5) The DNS query destination port is 53. The source response port is also 53. Port 53 is the default port for DNS.
- 6) The DNS query destination IP address is 137.99.25.14, which is the same as the IP address of the default local DNS server.
- 7) The type of DNS query is "A, class IN". It contains zero answers.

Domain Name System (query)

[Response In: 173]

Transaction ID: 0xef2a

Flags: 0x0100 Standard query

0... .. = Response: Message is a query
.000 0... .. = Opcode: Standard query (0)
... ..0... .. = Truncated: Message is not truncated
... ..1... .. = Recursion desired: Do query recursively
... ..0... .. = Z: reserved (0)
... ..0... .. = Non-authenticated data: Unacceptable

Questions: 1

Answer RRs: 0

Authority RRs: 0

Additional RRs: 0

Queries

www.ietf.org: type A, class IN

- 8) Three answers were provided, containing the information in the answers below (the first contained a CNAME, the second and third containing A Records):

Answers

www.ietf.org: type CNAME, class IN, cname www.ietf.org.cdn.cloudflare.net

Name: www.ietf.org

Type: CNAME (Canonical NAME for an alias) (5)

Class: IN (0x0001)

Time to live: 1800

Data length: 33

CNAME: www.ietf.org.cdn.cloudflare.net

www.ietf.org.cdn.cloudflare.net: type A, class IN, addr 104.20.1.85

Name: www.ietf.org.cdn.cloudflare.net

Type: A (Host Address) (1)

Class: IN (0x0001)

Time to live: 300

Data length: 4

Address: 104.20.1.85

www.ietf.org.cdn.cloudflare.net: type A, class IN, addr 104.20.0.85

Name: www.ietf.org.cdn.cloudflare.net

Type: A (Host Address) (1)

Class: IN (0x0001)

Time to live: 300

Data length: 4

Address: 104.20.0.85

9) The destination IP address of the TCP SYN packet corresponds to the first A record provided by the DNS response (see below):

8	3.075845	128.238.38.160	128.238.29.23	DNS	72	Standard query 0x006e A www.ietf.org
9	3.076689	128.238.29.23	128.238.38.160	DNS	104	Standard query response 0x006e A www.ietf.org A 132.151.6.75
10	3.078479	128.238.38.160	132.151.6.75	TCP	62	3369 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1
11	3.096413	132.151.6.75	128.238.38.160	TCP	62	80 → 3369 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1380 SACK
12	3.096463	128.238.38.160	132.151.6.75	TCP	54	3369 → 80 [ACK] Seq=1 Ack=1 Win=64860 Len=0
13	3.096708	128.238.38.160	132.151.6.75	HTTP	429	GET / HTTP/1.1
14	3.111678	132.151.6.75	128.238.38.160	TCP	60	80 → 3369 [ACK] Seq=1 Ack=376 Win=6432 Len=0
15	3.120640	132.151.6.75	128.238.38.160	TCP	1434	80 → 3369 [ACK] Seq=1 Ack=376 Win=6432 Len=1380 [TCP segment

Authority RRs: 0
Additional RRs: 0

► Queries

▼ Answers

▼ www.ietf.org: type A, class IN, addr 132.151.6.75

Name: www.ietf.org
Type: A (Host Address) (1)
Class: IN (0x0001)
Time to live: 1678
Data length: 4
Address: 132.151.6.75

10) There are no more DNS queries in the trace, hence my host must not be doing a new DNS query before retrieving each image.

11) The destination port of the DNS query and the source port of the DNS response were both 53.

12) The DNS request was sent to 137.99.25.14, which appears to be the local UConn DNS server.

No.	Time	Source	Destination	Protocol	Length	Info
8	1.809522	137.99.154.8	137.99.25.14	DNS	71	Standard query 0xb142 A www.mit.edu
9	1.814241	137.99.25.14	137.99.154.8	DNS	160	Standard query response 0xb142 A www.mit.edu CNAME www.mit.edu.edg...
14	3.903581	137.99.154.8	52.109.88.39	TLSv1...	151	Encrypted Alert
15	3.903903	137.99.154.8	52.109.88.39	TCP	66	61852 → 443 [FIN, ACK] Seq=86 Ack=1 Win=4096 Len=0 TSval=391929013...
16	3.999043	52.109.88.39	137.99.154.8	TCP	66	443 → 61852 [ACK] Seq=1 Ack=87 Win=508 Len=0 TSval=580127 TSecr=39...
17	4.002068	52.109.88.39	137.99.154.8	TCP	66	443 → 61852 [FIN, ACK] Seq=1 Ack=87 Win=508 Len=0 TSval=580128 TSe...
18	4.002155	137.99.154.8	52.109.88.39	TCP	66	61852 → 443 [ACK] Seq=87 Ack=2 Win=4096 Len=0 TSval=391929110 TSec...

13) The type of DNS message is a "A, class IN". It does not contain any answers.

► User Datagram Protocol, Src Port: 51683, Dst Port: 53
▼ Domain Name System (query)
[Response In: 9]
Transaction ID: 0xb142
▼ Flags: 0x0100 Standard query
0... .. = Response: Message is a query
.000 0... .. = Opcode: Standard query (0)
.... 0... .. = Truncated: Message is not truncated
.... 1... .. = Recursion desired: Do query recursively
.... 0... .. = Z: reserved (0)
.... 0... .. = Non-authenticated data: Unacceptable
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 0
► Queries

14) Three answers were provided (see below), two CNAME records and one A record.

9	1.814241	137.99.25.14	137.99.154.8	DNS	160	Standard query response 0xb142 A www.mit.edu CNAME www.mit.edu
14	3.903581	137.99.154.8	52.109.88.39	TLSv1...	151	Encrypted Alert
15	3.003003	137.99.154.8	52.109.88.39	TCP	66	61852 → 443 [ESTN ACK] Seq=86 Ack=1 Win=4096 Len=0 TSval=3010

Additional RRs: 0

- Queries
- Answers
 - www.mit.edu: type CNAME, class IN, cname www.mit.edu.edgekey.net
 - Name: www.mit.edu
 - Type: CNAME (Canonical NAME for an alias) (5)
 - Class: IN (0x0001)
 - Time to live: 1041
 - Data length: 25
 - CNAME: www.mit.edu.edgekey.net
 - www.mit.edu.edgekey.net: type CNAME, class IN, cname e9566.dscb.akamaiedge.net
 - Name: www.mit.edu.edgekey.net
 - Type: CNAME (Canonical NAME for an alias) (5)
 - Class: IN (0x0001)
 - Time to live: 26
 - Data length: 24
 - CNAME: e9566.dscb.akamaiedge.net
 - e9566.dscb.akamaiedge.net: type A, class IN, addr 23.14.144.128
 - Name: e9566.dscb.akamaiedge.net
 - Type: A (Host Address) (1)
 - Class: IN (0x0001)
 - Time to live: 6
 - Data length: 4
 - Address: 23.14.144.128

15) See response to questions 12 and 14 (above).

16) The DNS query message is sent to 137.99.25.14, the default local nameserver.

No.	Time	Source	Destination	Protocol	Length	Info
119	0.675534	137.99.154.8	137.99.25.14	DNS	67	Standard query 0xb741 NS mit.edu
120	0.691196	137.99.25.14	137.99.154.8	DNS	234	Standard query response 0xb741 NS mit.edu NS usw2.akam.net NS

17) The type of DNS query is "A, class IN". It contains no answers:

Domain Name System (query)
[Response In: 120]
Transaction ID: 0xb741
Flags: 0x0100 Standard query
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 0
Queries

18) The MIT nameservers provided by the response are detailed below. The IP addresses of these servers were not included.

▼ Answers

- ▼ mit.edu: type NS, class IN, ns usw2.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800
 - Data length: 15
 - Name Server: usw2.akam.net
- ▼ mit.edu: type NS, class IN, ns asia2.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800
 - Data length: 8
 - Name Server: asia2.akam.net
- ▼ mit.edu: type NS, class IN, ns use5.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800
 - Data length: 7
 - Name Server: use5.akam.net
- ▼ mit.edu: type NS, class IN, ns ns1-173.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800
 - Data length: 10
 - Name Server: ns1-173.akam.net
- ▼ mit.edu: type NS, class IN, ns eur5.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800
 - Data length: 7
 - Name Server: eur5.akam.net
- ▼ mit.edu: type NS, class IN, ns use2.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800
 - Data length: 7
 - Name Server: use2.akam.net
- ▼ mit.edu: type NS, class IN, ns ns1-37.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800
 - Data length: 9
 - Name Server: ns1-37.akam.net
- ▼ mit.edu: type NS, class IN, ns asia1.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800
 - Data length: 8
 - Name Server: asia1.akam.net

19) See screenshot below.

The screenshot shows a Wireshark capture of network traffic. The top toolbar includes various icons for file operations, editing, and analysis. The packet list pane on the left shows several packets, with packet 120 selected. The packet details pane on the right shows the structure of the selected packet, which is a DNS Standard query response. The packet bytes pane at the bottom shows the raw data of the packet.

No.	Time	Source	Destination	Protocol	Length	Info
119	0.675534	137.99.154.8	137.99.25.14	DNS	67	Standard query 0xb741 NS mit.edu
120	0.691196	137.99.25.14	137.99.154.8	DNS	234	Standard query response 0xb741 NS mit.edu NS usw2.akam.net NS
4	0.234921	69.164.0.128	137.99.154.8	TCP	66	443 → 62087 [ACK] Seq=1 Ack=582 Win=12463 Len=0 TSval=2655818

Frame 120: 234 bytes on wire (1872 bits), 234 bytes captured (1872 bits) on interface 0

Ethernet II, Src: Cisco_ff:fc:c8 (00:08:e3:ff:fc:c8), Dst: Apple_12:5e:b5 (28:cf:e9:12:5e:b5)

Internet Protocol Version 4, Src: 137.99.25.14, Dst: 137.99.154.8

User Datagram Protocol, Src Port: 53, Dst Port: 54209

Domain Name System (response)

[Request In: 119]

[Time: 0.015662000 seconds]

Transaction ID: 0xb741

Flags: 0x8180 Standard query response, No error

Questions: 1

Answer RRs: 8

Authority RRs: 0

Additional RRs: 0

Queries

Answers

- ▼ mit.edu: type NS, class IN, ns usw2.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800
 - Data length: 15
 - Name Server: usw2.akam.net
- ▼ mit.edu: type NS, class IN, ns asia2.akam.net
 - Name: mit.edu
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 1800

20) [Note: Had to use provided trace as the specified endpoint was down] The original DNS query is sent to 18.72.0.3, the default local DNS server.

21) The type of message is "PTR, class IN". It contains no answers.

Apply a display filter ... <%%/>

No.	Time	Source	Destination	Protocol	Length	Info
95	4.118224	Computer_b4:14:84	Broadcast	ARP	60	Who has 128.238.38.40? Tell 128.238.38.201
96	4.155917	Computer_b4:29:2a	Broadcast	ARP	60	Who has 128.238.38.4? Tell 128.238.38.238
97	4.186743	128.238.38.207	128.238.38.255	BROWS...	254	Domain/Workgroup Announcement MSHOME, NT Workstation, Domain f
98	4.264818	Ibm_10:60:99	Broadcast	ARP	42	Who has 128.238.38.1? Tell 128.238.38.160
99	4.265286	ALL-HSRP-routers_00	Ibm_10:60:99	ARP	60	128.238.38.1 is at 00:00:0c:07:ac:00
100	4.265296	128.238.38.160	18.72.0.3	DNS	82	Standard query 0x0001 PTR 3.0.72.18.in-addr.arpa
101	4.278516	18.72.0.3	128.238.38.160	DNS	212	Standard query response 0x0001 PTR 3.0.72.18.in-addr.arpa PTR
102	4.279430	128.238.38.160	18.72.0.3	DNS	83	Standard query 0x0002 A www.ait.or.kr.poly.edu
103	4.293283	18.72.0.3	128.238.38.160	DNS	135	Standard query response 0x0002 No such name A www.ait.or.kr.f
104	4.293517	128.238.38.160	18.72.0.3	DNS	74	Standard query 0x0003 A www.ait.or.kr
105	4.307859	18.72.0.3	128.238.38.160	DNS	156	Standard query response 0x0003 A www.ait.or.kr A 218.36.94.2
106	4.315531	Computer_b4:14:84	Broadcast	ARP	60	Who has 128.238.38.55? Tell 128.238.38.201
107	4.381367	Computer_b4:29:2a	Broadcast	ARP	60	Who has 128.238.38.168? Tell 128.238.38.238
108	4.386317	00000000_00h0h0b41	00000000_ffffffff	NBT	98	Find name 128 173 44 206<20>

Frame 100: 82 bytes on wire (656 bits), 82 bytes captured (656 bits)

Ethernet II, Src: Ibm_10:60:99 (00:09:6b:10:60:99), Dst: ALL-HSRP-routers_00 (00:00:0c:07:ac:00)

Internet Protocol Version 4, Src: 128.238.38.160, Dst: 18.72.0.3

User Datagram Protocol, Src Port: 3751, Dst Port: 53

Domain Name System (query)

[Response In: 101]

Transaction ID: 0x0001

Flags: 0x0100 Standard query

0... .. = Response: Message is a query

.000 0... .. = Opcode: Standard query (0)

... ..0... .. = Truncated: Message is not truncated

... ..1... .. = Recursion desired: Do query recursively

... ..0... .. = Z: reserved (0)

... ..0... .. = Non-authenticated data: Unacceptable

Questions: 1

Answer RRs: 0

Authority RRs: 0

Additional RRs: 0

Queries

3.0.72.18.in-addr.arpa: type PTR, class IN

Name: 3.0.72.18.in-addr.arpa

[Name Length: 22]

[Label Count: 6]

Type: PTR (domain name PoinTeR) (12)

Class: IN (0x0001)

22) There was one "Answer RR" provided, which contained the following:

Answers

3.0.72.18.in-addr.arpa: type PTR, class IN, BITSY.MIT.EDU

Name: 3.0.72.18.in-addr.arpa

Type: PTR (domain name PoinTeR) (12)

Class: IN (0x0001)

Time to live: 21600

Data length: 15

Domain Name: BITSY.MIT.EDU

The response also contained three authoritative nameservers and three additional records:

▼ Authoritative nameservers

- ▼ 18.in-addr.arpa: type NS, class IN, ns W20NS.MIT.EDU
 - Name: 18.in-addr.arpa
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 21600
 - Data length: 8
 - Name Server: W20NS.MIT.EDU
- ▼ 18.in-addr.arpa: type NS, class IN, ns BITSY.MIT.EDU
 - Name: 18.in-addr.arpa
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 21600
 - Data length: 2
 - Name Server: BITSY.MIT.EDU
- ▼ 18.in-addr.arpa: type NS, class IN, ns STRAWB.MIT.EDU
 - Name: 18.in-addr.arpa
 - Type: NS (authoritative Name Server) (2)
 - Class: IN (0x0001)
 - Time to live: 21600
 - Data length: 9
 - Name Server: STRAWB.MIT.EDU
- ▼ Additional records
 - ▼ W20NS.MIT.EDU: type A, class IN, addr 18.70.0.160
 - Name: W20NS.MIT.EDU
 - Type: A (Host Address) (1)
 - Class: IN (0x0001)
 - Time to live: 21600
 - Data length: 4
 - Address: 18.70.0.160
 - ▼ BITSY.MIT.EDU: type A, class IN, addr 18.72.0.3
 - Name: BITSY.MIT.EDU
 - Type: A (Host Address) (1)
 - Class: IN (0x0001)
 - Time to live: 21600
 - Data length: 4
 - Address: 18.72.0.3
 - ▼ STRAWB.MIT.EDU: type A, class IN, addr 18.71.0.151