

טבלה 2 - תקשורת

.1

ביצענו פקודה nslookup עבור הכתובתasiaregistry.com וכותבת ה-IP שהתקבלה הינה
119.252.177.34

```
C:\Users\home>nslookup asiaregistry.com
Server:  UnKnown
Address:  192.168.190.2

Name:      asiaregistry.com.localdomain
Address:   119.252.177.34

C:\Users\home>
```

.2

ביצענו פקודה nslookup עבור אוניברסיטת קمبرידג' וכותבת ה-IP שהתקבלה הינה 213.57.22.5

```
C:\Users\Almog>nslookup -type=NS cam.ac.uk
Server:  ns2-cache.hotnet.net.il
Address:  213.57.22.5

Non-authoritative answer:
cam.ac.uk      nameserver = ns3.mythic-beasts.com
cam.ac.uk      nameserver = dns0.eng.cam.ac.uk
cam.ac.uk      nameserver = auth0.dns.cam.ac.uk
cam.ac.uk      nameserver = ns1.mythic-beasts.com
cam.ac.uk      nameserver = ns2.ic.ac.uk
cam.ac.uk      nameserver = dns0.cl.cam.ac.uk

dns0.cl.cam.ac.uk      internet address = 128.232.0.19
auth0.dns.cam.ac.uk    internet address = 131.111.8.37
ns3.mythic-beasts.com  internet address = 185.24.221.32
ns1.mythic-beasts.com  internet address = 45.33.127.156
dns0.eng.cam.ac.uk     internet address = 129.169.8.8
ns2.ic.ac.uk          internet address = 155.198.142.82
auth0.dns.cam.ac.uk    AAAA IPv6 address = 2001:630:212:8::d:a0
ns3.mythic-beasts.com  AAAA IPv6 address = 2a02:2770:11:0:21a:4aff:febe:759b
ns1.mythic-beasts.com  AAAA IPv6 address = 2600:3c00:e000:19::1
ns2.ic.ac.uk          AAAA IPv6 address = 2a0c:5bc0:4:1::82
```

.3

לא התקבלה שום כתובת IP עבור כל אחד מכתובת הdns שהתקבלו בשאלת 2. (דוגמא להלן).

```
C:\Users\Almog>nslookup mail.yahoo.com dns0.cl.cam.ac.uk
DNS request timed out.
    timeout was 2 seconds.
Server:  UnKnown
Address:  128.232.0.19

DNS request timed out.
    timeout was 2 seconds.
*** Request to UnKnown timed-out
```

הabilities נשלחו באמצעות UDP כפי שסימנו בתמונה.

No.	Time	Source	Destination	Protocol	Length	Info
25	0.918815	192.168.190.128	192.168.190.2	DNS	72	Standard query 0x7195 A www.ietf.org
26	0.930280	192.168.190.2	192.168.190.128	DNS	459	Standard query response 0x7195 A www.ietf.org CNAME www.ietf.org.cdn.cloudflare.com
27	0.930981	192.168.190.128	104.16.44.99	TCP	66	60304 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
28	0.931269	192.168.190.128	104.16.44.99	TCP	66	60305 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
29	1.010435	104.16.44.99	192.168.190.128	TCP	60	443 → 60304 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
30	1.010497	192.168.190.128	104.16.44.99	TCP	54	60304 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
31	1.010786	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello
32	1.011016	104.16.44.99	192.168.190.128	TCP	60	443 → 60304 [ACK] Seq=1 Ack=545 Win=64240 Len=0
33	1.023802	104.16.44.99	192.168.190.128	TCP	60	443 → 60305 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
34	1.023869	192.168.190.128	104.16.44.99	TCP	54	60305 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
35	1.024183	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello

> Frame 25: 72 bytes on wire (576 bits), 72 bytes captured (576 bits) on interface \Device\NPF_{53007737-6105-4D3A-928F-191742D20C4F}, id 0
> Ethernet II, Src: VMware_ca:89:54 (00:0c:29:ca:89:54), Dst: VMware_e6:94:d4 (00:50:56:e6:94:d4)
> Internet Protocol Version 4, Src: 192.168.190.128, Dst: 192.168.190.2
> User Datagram Protocol, Src Port: 63996, Dst Port: 53
> Domain Name System (query)

No.	Time	Source	Destination	Protocol	Length	Info
25	0.918815	192.168.190.2	192.168.190.2	DNS	72	Standard query 0x7195 A www.ietf.org
26	0.930280	192.168.190.2	192.168.190.128	DNS	459	Standard query response 0x7195 A www.ietf.org CNAME www.ietf.org.cdn.cloudflare.com
27	0.930981	192.168.190.128	104.16.44.99	TCP	66	60304 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
28	0.931269	192.168.190.128	104.16.44.99	TCP	66	60305 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
29	1.010435	104.16.44.99	192.168.190.128	TCP	60	443 → 60304 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
30	1.010497	192.168.190.128	104.16.44.99	TCP	54	60304 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
31	1.010786	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello
32	1.011016	104.16.44.99	192.168.190.128	TCP	60	443 → 60304 [ACK] Seq=1 Ack=545 Win=64240 Len=0
33	1.023802	104.16.44.99	192.168.190.128	TCP	60	443 → 60305 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
34	1.023869	192.168.190.128	104.16.44.99	TCP	54	60305 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
35	1.024183	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello

> Frame 26: 459 bytes on wire (3672 bits), 459 bytes captured (3672 bits) on interface \Device\NPF_{53007737-6105-4D3A-928F-191742D20C4F}, id 0
> Ethernet II, Src: VMware_e6:94:d4 (00:50:56:e6:94:d4), Dst: VMware_ca:89:54 (00:0c:29:ca:89:54)
> Internet Protocol Version 4, Src: 192.168.190.2, Dst: 192.168.190.128
> User Datagram Protocol, Src Port: 53, Dst Port: 63996
> Domain Name System (Response)

.5

פורט היעד עבר שאלת DNS הינו 53

No.	Time	Source	Destination	Protocol	Length	Info
25	0.918815	192.168.190.128	192.168.190.2	DNS	72	Standard query 0x7195 A www.ietf.org
26	0.930280	192.168.190.2	192.168.190.128	DNS	459	Standard query response 0x7195 A www.ietf.org CNAME www.ietf.org.cdn.cloudflare.com
27	0.950961	192.168.190.128	104.16.44.99	TCP	66	60304 + 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
28	0.951269	192.168.190.128	104.16.44.99	TCP	66	60305 + 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
29	1.010435	104.16.44.99	192.168.190.128	TCP	60	443 + 60304 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
30	1.010497	192.168.190.128	104.16.44.99	TCP	54	60304 + 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
31	1.010786	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello
32	1.011016	104.16.44.99	192.168.190.128	TCP	60	443 + 60304 [ACK] Seq=1 Ack=545 Win=64240 Len=0
33	1.023802	104.16.44.99	192.168.190.128	TCP	60	443 + 60305 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
34	1.023869	192.168.190.128	104.16.44.99	TCP	54	60305 + 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
35	1.024183	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello

> Internet Protocol Version 4, Src: 192.168.190.128, Dst: 192.168.190.2

∨ User Datagram Protocol, Src Port: 63996, Dst Port: 53

Source Port: 63996
Destination Port: 53
Length: 38
Checksum: 0xfe0b [unverified]
[Checksum Status: Unverified]
[Stream index: 1]
[Timestamps]
UDP payload (30 bytes)

> Domain Name System (query)

פורט המוצא עבר תגובה שאלת DNS הינו 53

No.	Time	Source	Destination	Protocol	Length	Info
25	0.918815	192.168.190.128	192.168.190.2	DNS	72	Standard query 0x7195 A www.ietf.org
26	0.930280	192.168.190.2	192.168.190.128	DNS	459	Standard query response 0x7195 A www.ietf.org CNAME www.ietf.org.cdn.cloudflare.com
27	0.930961	192.168.190.128	104.16.44.99	TCP	66	60304 + 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
28	0.931269	192.168.190.128	104.16.44.99	TCP	66	60305 + 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
29	1.010435	104.16.44.99	192.168.190.128	TCP	60	443 + 60304 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
30	1.010497	192.168.190.128	104.16.44.99	TCP	54	60304 + 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
31	1.010786	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello
32	1.011016	104.16.44.99	192.168.190.128	TCP	60	443 + 60304 [ACK] Seq=1 Ack=545 Win=64240 Len=0
33	1.023802	104.16.44.99	192.168.190.128	TCP	60	443 + 60305 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
34	1.023869	192.168.190.128	104.16.44.99	TCP	54	60305 + 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
35	1.024183	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello

> Internet Protocol Version 4, Src: 192.168.190.2, Dst: 192.168.190.128

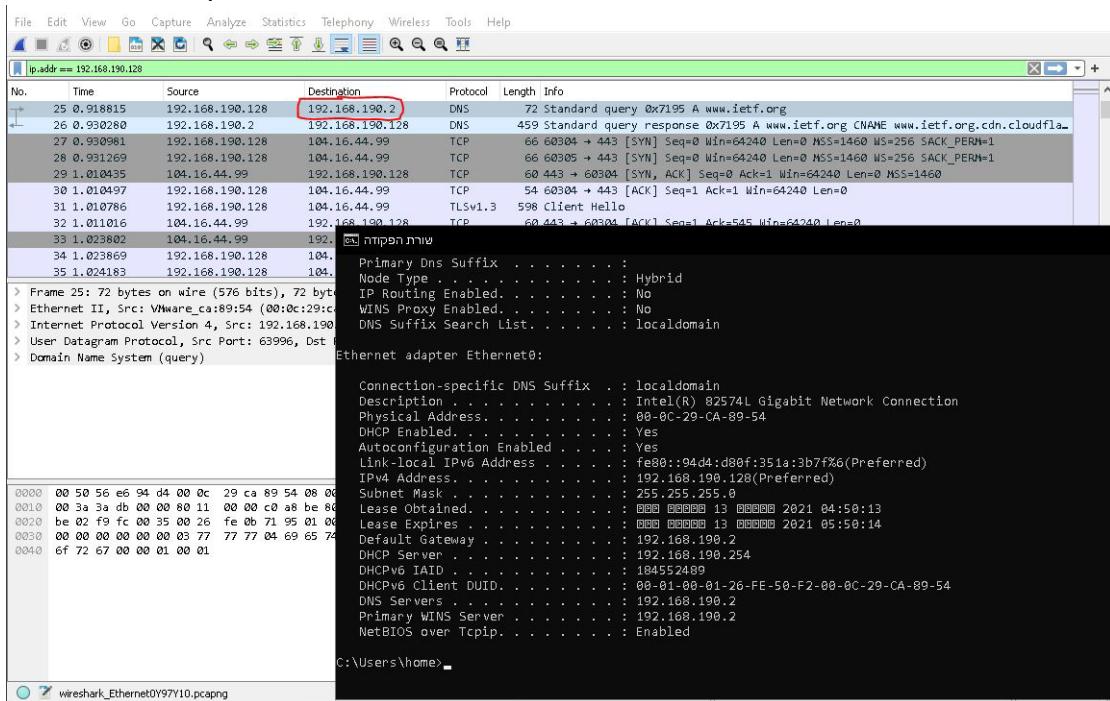
∨ User Datagram Protocol, Src Port: 53, Dst Port: 63996

Source Port: 53
Destination Port: 63996
Length: 425
Checksum: 0xe3fe [unverified]
[Checksum Status: Unverified]
[Stream index: 1]
[Timestamps]
UDP payload (417 bytes)

> Domain Name System (response)

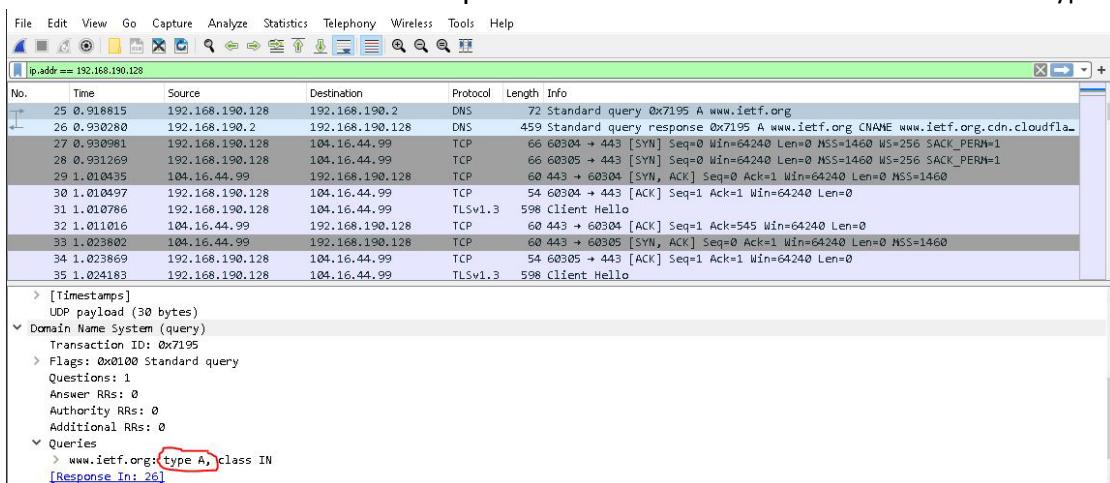
.6

שאילתת DNS נשלחה לכתובת 192.168.190.2 שהיא אחת מכתובות הDNS המקומיים שבמחשב.



.7

הינו A והשאילתת DNS אינה מכילה תשובה כלשהן.



.8

ישם 3 תשובות.

רשומת CNAME המשמשת לקבלת דומיין ואינה מכילה כתובות IP.

2 רשומות נוספתן את שם המארח, כתובות IP, Type TTL וגודל הנתונים.

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help						
No.	Time	Source	Destination	Protocol	Length	Info
25	0.918815	192.168.190.128	192.168.190.2	DNS	72	Standard query 0x7195 A www.ietf.org
26	0.930280	192.168.190.2	192.168.190.128	DNS	459	Standard query response 0x7195 A www.ietf.org CNAME www.ietf.org.cdn.cloudflare.net
27	0.930981	192.168.190.128	104.16.44.99	TCP	66	60304 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
28	0.931269	192.168.190.128	104.16.44.99	TCP	66	60305 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
29	1.010435	104.16.44.99	192.168.190.128	TCP	60	443 → 60304 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
30	1.010497	192.168.190.128	104.16.44.99	TCP	54	60304 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
31	1.010786	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello
32	1.011016	104.16.44.99	192.168.190.128	TCP	60	443 → 60305 [ACK] Seq=1 Ack=545 Win=64240 Len=0
33	1.023802	104.16.44.99	192.168.190.128	TCP	60	443 → 60305 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
34	1.023869	192.168.190.128	104.16.44.99	TCP	54	60305 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
35	1.024183	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello

Additional RR: 10

Queries

- > www.ietf.org: type A, class IN

Answers

- > www.ietf.org: type CNAME, class IN, cname www.ietf.org.cdn.cloudflare.net
- > www.ietf.org.cdn.cloudflare.net: type A, class IN, addr 104.16.44.99
- > www.ietf.org.cdn.cloudflare.net: type A, class IN, addr 104.16.45.99

Authoritative nameservers

Additional records

[Request In: 25]

[Time: 0.011465000 seconds]

.9

חבילת TCP SYN נשלחה מהמחשב לכתובת הראשונה שהתקבלה מתגובה שאלית DNS שהרנו לעיל.

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help						
No.	Time	Source	Destination	Protocol	Length	Info
25	0.918815	192.168.190.128	192.168.190.2	DNS	72	Standard query 0x7195 A www.ietf.org
26	0.930280	192.168.190.2	192.168.190.128	DNS	459	Standard query response 0x7195 A www.ietf.org CNAME www.ietf.org.cdn.cloudflare.net
27	0.930981	192.168.190.128	104.16.44.99	TCP	66	60304 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
28	0.931269	192.168.190.128	104.16.44.99	TCP	66	60305 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
29	1.010435	104.16.44.99	192.168.190.128	TCP	60	443 → 60304 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
30	1.010497	192.168.190.128	104.16.44.99	TCP	54	60304 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
31	1.010786	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello
32	1.011016	104.16.44.99	192.168.190.128	TCP	60	443 → 60305 [ACK] Seq=1 Ack=545 Win=64240 Len=0
33	1.023802	104.16.44.99	192.168.190.128	TCP	60	443 → 60305 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460
34	1.023869	192.168.190.128	104.16.44.99	TCP	54	60305 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
35	1.024183	192.168.190.128	104.16.44.99	TLSv1.3	598	Client Hello

Additional RR: 10

Queries

- > www.ietf.org: type A, class IN

Answers

- > www.ietf.org: type CNAME, class IN, cname www.ietf.org.cdn.cloudflare.net
- > www.ietf.org.cdn.cloudflare.net: type A, class IN, addr 104.16.44.99
- > www.ietf.org.cdn.cloudflare.net: type A, class IN, addr 104.16.45.99

Authoritative nameservers

Additional records

[Request In: 25]

[Time: 0.011465000 seconds]

.10

לא. המחשב המארח לא הנפיק שאלות DNS נוספות לפני לקבלת כל תמונה כפי שניתן להבחן בקובץ PCAP המצורף.

.11

פורט היעד עבר שאלת DNS הינו 53

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.190.128	192.168.190.2	DNS	86	Standard query 0x0001 PTR 2.190.168.192.in-addr.arpa
2	0.020729	192.168.190.2	192.168.190.128	DNS	141	Standard query response 0x0001 No such name PTR 2.190.168.192.in-addr.arpa SOA 168.-
3	0.022355	192.168.190.128	192.168.190.2	DNS	83	Standard query 0x0002 A www.mit.edu.localdomain
4	0.114006	192.168.190.2	192.168.190.128	DNS	136	Standard query response 0x0002 A www.mit.edu.localdomain CNAME www.mit.edu.edgekey.-
5	0.114327	192.168.190.128	192.168.190.2	DNS	83	Standard query 0x0003 AAAA www.mit.edu.localdomain
6	0.130693	192.168.190.2	192.168.190.128	DNS	158	Standard query response 0x0003 No such name AAAA www.mit.edu.localdomain SOA a.root-

> Frame 3: 83 bytes on wire (664 bits), 83 bytes captured (664 bits) on interface \Device\NPF_{530D7737-6105-4D3A-928F-191742D20C4F}, id 0
> Ethernet II, Src: VMware_ca:89:54 (00:0c:29:ca:89:54), Dst: VMware_e6:94:d4 (00:50:56:e6:94:d4)
> Internet Protocol Version 4, Src: 192.168.190.128, Dst: 192.168.190.2
▼ User Datagram Protocol, Src Port: 60964, Dst Port: 53
Source Port: 60964
Destination Port: 53
Length: 49
Checksum: 0xfe16 [unverified]
[Checksum Status: Unverified]
[Stream index: 1]
> [Timestamps]
UDP payload (41 bytes)

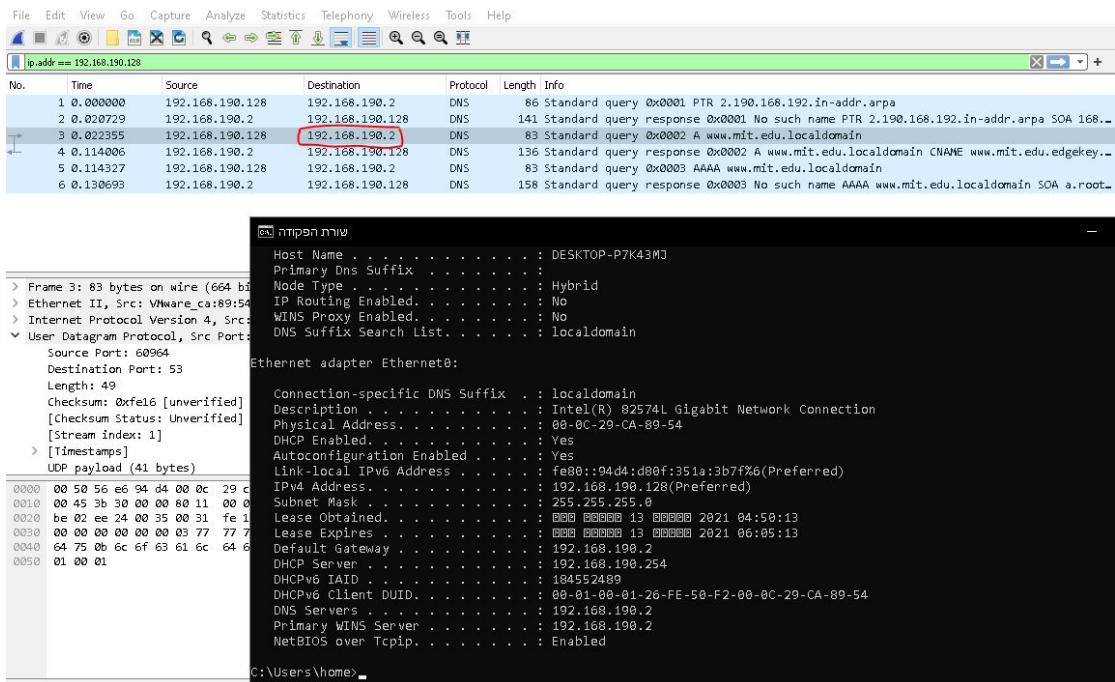
פורט המוצא עבר תגובה שאלת DNS הינו 53

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.190.128	192.168.190.2	DNS	86	Standard query 0x0001 PTR 2.190.168.192.in-addr.arpa
2	0.020729	192.168.190.2	192.168.190.128	DNS	141	Standard query response 0x0001 No such name PTR 2.190.168.192.in-addr.arpa SOA 168.-
3	0.022355	192.168.190.128	192.168.190.2	DNS	83	Standard query 0x0002 A www.mit.edu.localdomain
4	0.114006	192.168.190.2	192.168.190.128	DNS	136	Standard query response 0x0002 A www.mit.edu.localdomain CNAME www.mit.edu.edgekey.-
5	0.114327	192.168.190.128	192.168.190.2	DNS	83	Standard query 0x0003 AAAA www.mit.edu.localdomain
6	0.130693	192.168.190.2	192.168.190.128	DNS	158	Standard query response 0x0003 No such name AAAA www.mit.edu.localdomain SOA a.root-

> Frame 4: 136 bytes on wire (1088 bits), 136 bytes captured (1088 bits) on interface \Device\NPF_{530D7737-6105-4D3A-928F-191742D20C4F}, id 0
> Ethernet II, Src: VMware_e6:94:d4 (00:50:56:e6:94:d4), Dst: VMware_ca:89:54 (00:0c:29:ca:89:54)
> Internet Protocol Version 4, Src: 192.168.190.2, Dst: 192.168.190.128
▼ User Datagram Protocol, Src Port: 53, Dst Port: 60964
Source Port: 53
Destination Port: 60964
Length: 102
Checksum: 0x1aea [unverified]
[Checksum Status: Unverified]
[Stream index: 1]
> [Timestamps]
UDP payload (94 bytes)

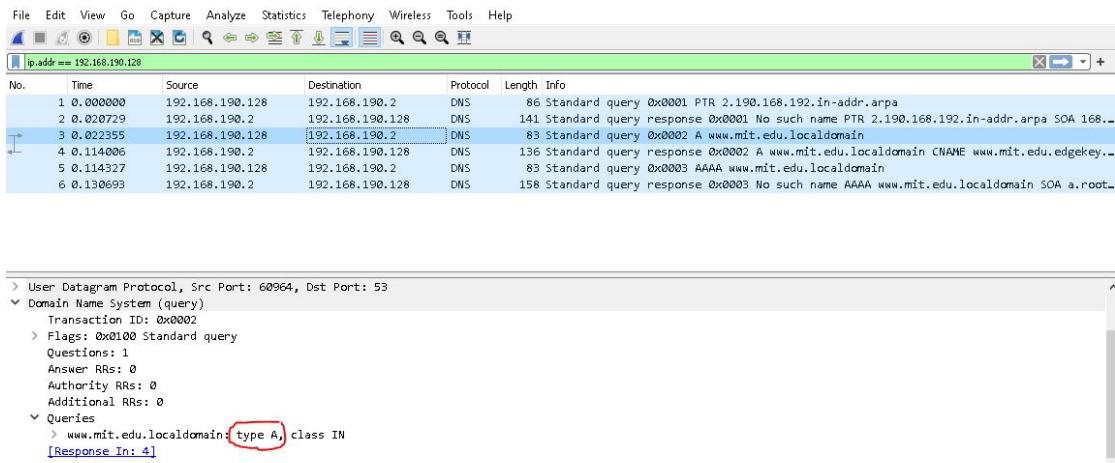
.12

שאילתת DNS נשלחה לכתובת 192.168.190.2 שהיא אחת מכתובות DNS המקומיים שבמחשב.



.13

שאילתת DNS הינו A והשאילה אינה מכילה תשיבות כlishan.



.14

ישם 2 תשובות.

רשומת CNAME המשמשת לקבלת דומיין ואני מכילה כתובות IP.
רשומה נוספת את שם המארח, כתובות TTL, Type וגודל הננתונים.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.190.128	192.168.190.2	DNS	86	Standard query 0x0001 PTR 2.190.168.192.in-addr.arpa
2	0.020729	192.168.190.2	192.168.190.128	DNS	141	Standard query response 0x0001 No such name PTR 2.190.168.192.in-addr.arpa SOA 168.-
3	0.022355	192.168.190.128	192.168.190.2	DNS	83	Standard query 0x0002 A www.mit.edu.localdomain
4	0.114006	192.168.190.2	192.168.190.128	DNS	136	Standard query response 0x0002 A www.mit.edu.localdomain CNAME www.mit.edu.edgekey.-
5	0.114327	192.168.190.128	192.168.190.2	DNS	83	Standard query 0x0003 AAAA www.mit.edu.localdomain
6	0.130693	192.168.190.2	192.168.190.128	DNS	158	Standard query response 0x0003 No such name AAAA www.mit.edu.localdomain SOA a.root-

Questions: 1
Answer RRs: 2
Authority RRs: 0
Additional RRs: 0
Queries
> www.mit.edu.localdomain: type A, class IN
Answers
> www.mit.edu.localdomain: type CNAME, class IN, cname www.mit.edu.edgekey.net
> www.mit.edu.edgekey.net: type A, class IN, addr 104.83.115.155
[Request In: 3]
[Time: 0.091651000 seconds]

.15

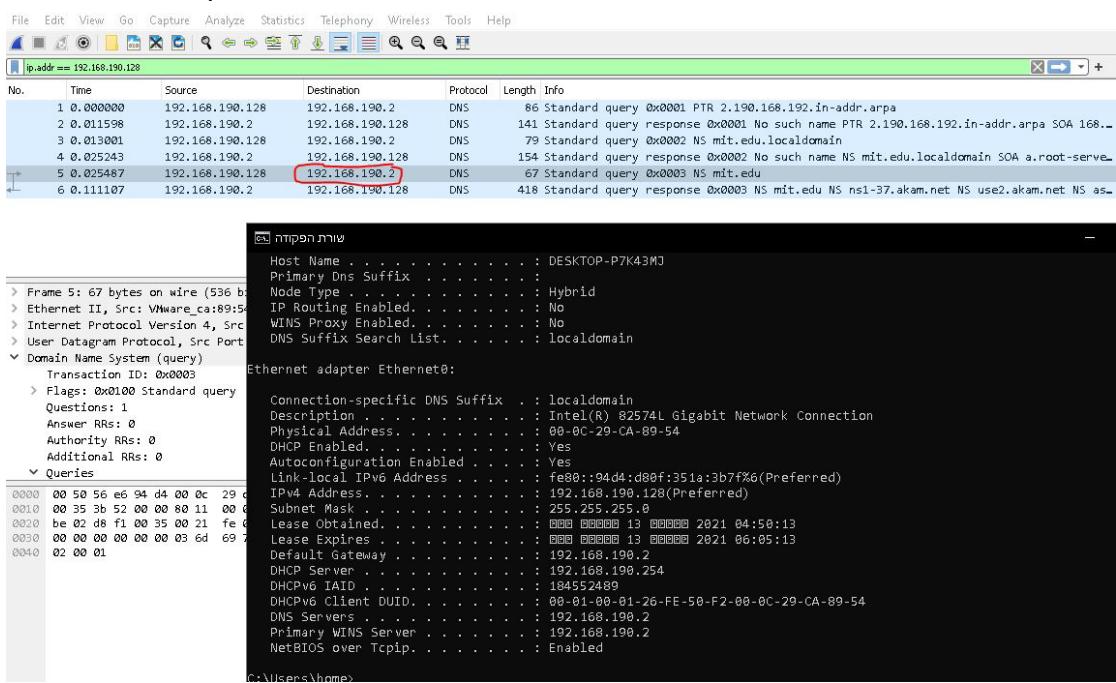
צילום מסך זה צורף בסעיף הקודם ובכל סעיף בהתאם.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.190.128	192.168.190.2	DNS	86	Standard query 0x0001 PTR 2.190.168.192.in-addr.arpa
2	0.020729	192.168.190.2	192.168.190.128	DNS	141	Standard query response 0x0001 No such name PTR 2.190.168.192.in-addr.arpa SOA 168.-
3	0.022355	192.168.190.128	192.168.190.2	DNS	83	Standard query 0x0002 A www.mit.edu.localdomain
4	0.114006	192.168.190.2	192.168.190.128	DNS	136	Standard query response 0x0002 A www.mit.edu.localdomain CNAME www.mit.edu.edgekey.-
5	0.114327	192.168.190.128	192.168.190.2	DNS	83	Standard query 0x0003 AAAA www.mit.edu.localdomain
6	0.130693	192.168.190.2	192.168.190.128	DNS	158	Standard query response 0x0003 No such name AAAA www.mit.edu.localdomain SOA a.root-

Questions: 1
Answer RRs: 2
Authority RRs: 0
Additional RRs: 0
Queries
> www.mit.edu.localdomain: type A, class IN
Answers
> www.mit.edu.localdomain: type CNAME, class IN, cname www.mit.edu.edgekey.net
> www.mit.edu.edgekey.net: type A, class IN, addr 104.83.115.155
[Request In: 3]
[Time: 0.091651000 seconds]

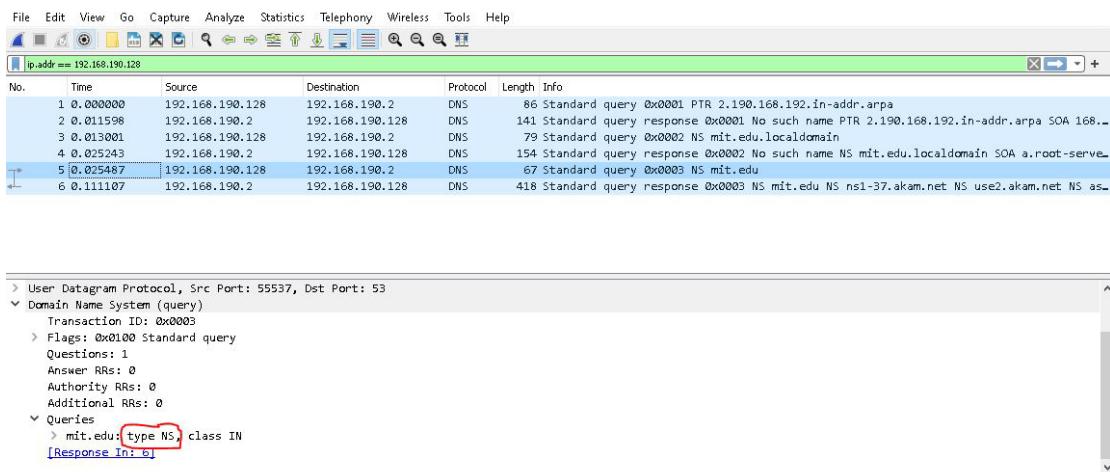
.16

שאילתת DNS נשלחה לכתובת 192.168.190.2 שהיא אחת מכתובות DNS המקומיים שבמחשב.



.17

שאילתת DNS הינו NS והשאילתת אינה מכילה תשובות כלשהן.



.18

שרותי שמות MIT שהתקבלו מתגובה שאילתת DNS הינה:
 ,use2.akam.net ,ns1-37.akam.net
 ns1- ,use5.akam.net ,usw2.akam.net ,asia1.akam.net ,eur5.akam.net ,asia2.akam.net
 .173.akam.net
 תגובה שאילתת DNS סיפקה את הכתובות של שירותי אלו תחת השדה ".Additional records"

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.190.128	192.168.190.2	DNS	86	Standard query 0x0001 PTR 2.190.168.192.in-addr.arpa
2	0.011598	192.168.190.2	192.168.190.128	DNS	141	Standard query response 0x0001 No such name PTR 2.190.168.192.in-addr.arpa SOA 168..
3	0.013001	192.168.190.128	192.168.190.2	DNS	79	Standard query 0x0002 NS mit.edu.localdomain
4	0.025243	192.168.190.2	192.168.190.128	DNS	154	Standard query response 0x0002 No such name NS mit.edu.localdomain SOA a.root-servers.net
5	0.025487	192.168.190.128	192.168.190.2	DNS	67	Standard query 0x0003 NS mit.edu
6	0.111107	192.168.190.2	192.168.190.128	DNS	418	Standard query response 0x0003 NS mit.edu NS NS1-37.akam.net NS USE2.akam.net NS AS.

▼ Queries
 > mit.edu: type NS, class IN
 ▼ Answers
 > mit.edu: type NS, class IN, ns ns1-37.akam.net
 > mit.edu: type NS, class IN, ns use2.akam.net
 > mit.edu: type NS, class IN, ns asia2.akam.net
 > mit.edu: type NS, class IN, ns eur5.akam.net
 > mit.edu: type NS, class IN, ns asia1.akam.net
 > mit.edu: type NS, class IN, ns usw2.akam.net
 > mit.edu: type NS, class IN, ns use5.akam.net
 > mit.edu: type NS, class IN, ns ns1-173.akam.net
 ▼ Additional records
 > asia2.akam.net: type A, class IN, addr 95.101.36.64
 > use5.akam.net: type A, class IN, addr 2.16.40.64
 > asia1.akam.net: type A, class IN, addr 95.100.175.64
 > ns1-173.akam.net: type A, class IN, addr 193.108.91.173
 > eur5.akam.net: type A, class IN, addr 23.74.25.64
 > usw2.akam.net: type A, class IN, addr 184.26.161.64
 > ns1-37.akam.net: type A, class IN, addr 193.108.91.37
 > use2.akam.net: type A, class IN, addr 96.7.49.64
 > use5.akam.net: type AAAA, class IN, addr 2600:1403:a::40
 > ns1-173.akam.net: type AAAA, class IN, addr 2600:1401:2::ad
 [Request In: 5]
 [Time: 0.085620000 seconds]

.19

צלום מסך זה צורף בסעיף הקודם ובכל סעיף בהתאם.

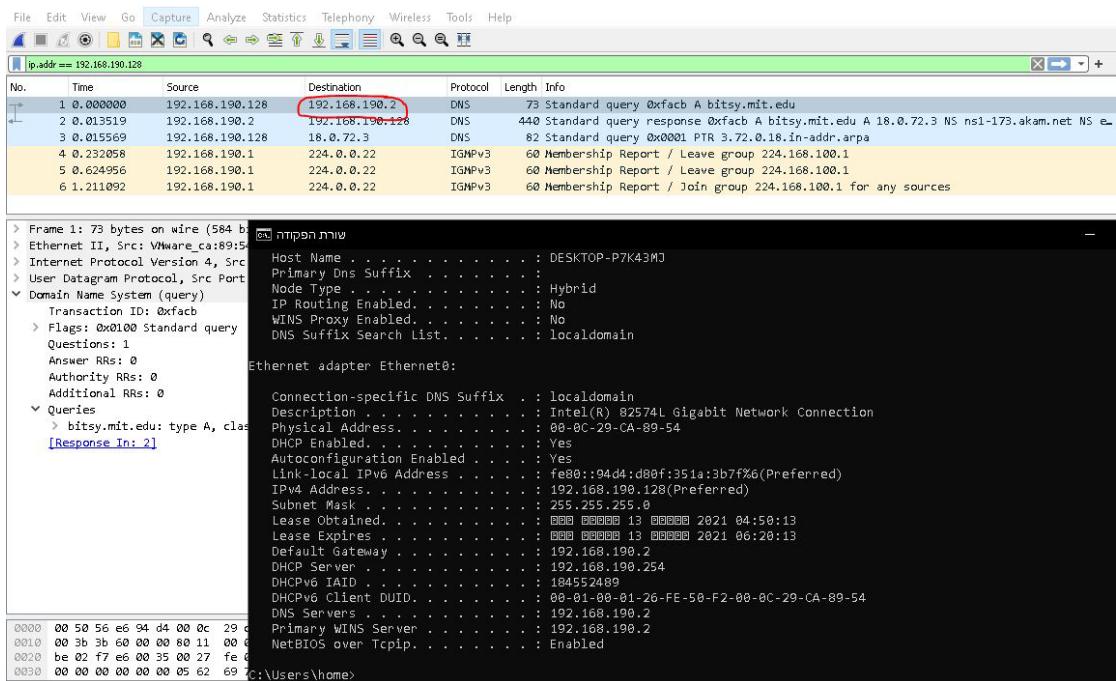
No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.190.128	192.168.190.2	DNS	86	Standard query 0x0001 PTR 2.190.168.192.in-addr.arpa
2	0.011598	192.168.190.2	192.168.190.128	DNS	141	Standard query response 0x0001 No such name PTR 2.190.168.192.in-addr.arpa SOA 168..
3	0.013001	192.168.190.128	192.168.190.2	DNS	79	Standard query 0x0002 NS mit.edu.localdomain
4	0.025243	192.168.190.2	192.168.190.128	DNS	154	Standard query response 0x0002 No such name NS mit.edu.localdomain SOA a.root-servers.net
5	0.025487	192.168.190.128	192.168.190.2	DNS	67	Standard query 0x0003 NS mit.edu
6	0.111107	192.168.190.2	192.168.190.128	DNS	418	Standard query response 0x0003 NS mit.edu NS NS1-37.akam.net NS USE2.akam.net NS AS.

▼ Queries
 > mit.edu: type NS, class IN
 ▼ Answers
 > mit.edu: type NS, class IN, ns ns1-37.akam.net
 > mit.edu: type NS, class IN, ns use2.akam.net
 > mit.edu: type NS, class IN, ns asia2.akam.net
 > mit.edu: type NS, class IN, ns eur5.akam.net
 > mit.edu: type NS, class IN, ns asia1.akam.net
 > mit.edu: type NS, class IN, ns usw2.akam.net
 > mit.edu: type NS, class IN, ns use5.akam.net
 > mit.edu: type NS, class IN, ns ns1-173.akam.net
 ▼ Additional records
 > asia2.akam.net: type A, class IN, addr 95.101.36.64
 > use5.akam.net: type A, class IN, addr 2.16.40.64
 > asia1.akam.net: type A, class IN, addr 95.100.175.64
 > ns1-173.akam.net: type A, class IN, addr 193.108.91.173
 > eur5.akam.net: type A, class IN, addr 23.74.25.64
 > usw2.akam.net: type A, class IN, addr 184.26.161.64
 > ns1-37.akam.net: type A, class IN, addr 193.108.91.37
 > use2.akam.net: type A, class IN, addr 96.7.49.64
 > use5.akam.net: type AAAA, class IN, addr 2600:1403:a::40
 > ns1-173.akam.net: type AAAA, class IN, addr 2600:1401:2::ad
 [Request In: 5]
 [Time: 0.085620000 seconds]

.20

שאילתת DNS הראשונה נשלחה לכתובת 192.168.190.2 שהיא אחת מכתובות DNS המקומיים שבמחשב.

השאילתת השנייה נשלחה לכתובת 18.0.72.3



.21
Type 2 שאלות DNS הינו A והשאילות אינן מכילות תשובות כלאן.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.190.128	192.168.190.2	DNS	73	Standard query 0xface A bitsy.mit.edu
2	0.013519	192.168.190.2	192.168.190.128	DNS	440	Standard query response 0xface A bitsy.mit.edu A 18.0.72.3 NS ns1-173.akam.net NS e
3	0.015569	192.168.190.128	18.0.72.3	DNS	82	Standard query 0x0001 PTR 3.72.0.18.in-addr.arpa
4	0.232058	192.168.190.1	224.0.0.22	IGMPv3	60	Membership Report / Leave group 224.168.100.1
5	0.624956	192.168.190.1	224.0.0.22	IGMPv3	60	Membership Report / Leave group 224.168.100.1
6	1.211092	192.168.190.1	224.0.0.22	IGMPv3	60	Membership Report / Join group 224.168.100.1 for any sources

```
> Frame 1: 73 bytes on wire (584 bits), 73 bytes captured (584 bits) on interface \Device\NPF_{53007737-6105-4D3A-928F-191742D20C4F}, id 0
> Ethernet II, Src: VMware_ca:89:54 (00:0c:29:ca:89:54), Dst: VMware_e6:94:d4 (00:50:56:e6:94:d4)
> Internet Protocol Version 4, Src: 192.168.190.128, Dst: 192.168.190.2
> User Datagram Protocol, Src Port: 63462, Dst Port: 53
> Domain Name System (query)
    Transaction ID: 0xface
    Flags: 0x0100 Standard query
    Questions: 1
    Answer RRs: 0
    Authority RRs: 0
    Additional RRs: 0
    > Queries
        > bitsy.mit.edu: type A, class IN
        [Response In: ?]
```

.22
בתגובה לשאלת DNS הראשונה סופקה רשומה המכילה את שם המארח bitsy.mit.edu, כתובות הIP, Type TTL וגודל הננתונים עבורי. ובעור השאלתה השנייה לא התקבלה תגובה (ומוביל לא התקבלה תשובה כלאן) מכיוון שהתקבלה שגיאת out timed בניסוי גישה לכתובת של bitsy.mit.edu כפי שניתן לראות בתמונה الأخيرة במסמך זה.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.190.128	192.168.190.2	DNS	73	Standard query 0xface A bitsy.mit.edu
2	0.013519	192.168.190.2	192.168.190.128	DNS	440	Standard query response 0xface A bitsy.mit.edu A 18.0.72.3 NS ns1-173.akam.net NS e
3	0.015569	192.168.190.128	18.0.72.3	DNS	82	Standard query 0x0001 PTR 3.72.0.18.in-addr.arpa
4	0.232058	192.168.190.1	224.0.0.22	IGMPv3	60	Membership Report / Leave group 224.168.100.1
5	0.624956	192.168.190.1	224.0.0.22	IGMPv3	60	Membership Report / Leave group 224.168.100.1
6	1.211092	192.168.190.1	224.0.0.22	IGMPv3	60	Membership Report / Join group 224.168.100.1 for any sources

```
> Answers
    > bitsy.mit.edu: type A, class IN, addr 18.0.72.3
    > Authoritative nameservers
        > mit.edu: type NS, class IN, ns ns1-173.akam.net
        > mit.edu: type NS, class IN, ns eur5.akam.net
        > mit.edu: type NS, class IN, ns use2.akam.net
        > mit.edu: type NS, class IN, ns asia1.akam.net
        > mit.edu: type NS, class IN, ns ns1-37.akam.net
        > mit.edu: type NS, class IN, ns usw2.akam.net
        > mit.edu: type NS, class IN, ns asia2.akam.net
        > mit.edu: type NS, class IN, ns use5.akam.net
    > Additional records
        > asia2.akam.net: type A, class IN, addr 95.101.36.64
        > use5.akam.net: type A, class IN, addr 2.16.40.64
        > asia1.akam.net: type A, class IN, addr 95.100.175.64
        > ns1-173.akam.net: type A, class IN, addr 193.108.91.173
        > eur5.akam.net: type A, class IN, addr 23.74.25.64
        > usw2.akam.net: type A, class IN, addr 184.26.161.64
        > ns1-37.akam.net: type A, class IN, addr 193.108.91.37
        > use2.akam.net: type A, class IN, addr 96.7.49.64
        > use5.akam.net: type AAAA, class IN, addr 2600:1403:a::40
        > ns1-173.akam.net: type AAAA, class IN, addr 2600:1401::ad
    [Request In: 1]
    [Time: 0.013519000 seconds]
```

```
DNS request timed out.
timeout was 2 seconds.
Server: UnKnown
Address: 18.0.72.3

DNS request timed out.
timeout was 2 seconds.
*** Request to UnKnown timed-out
```