

a) Cereri de adresa (A)

andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9\$ **dig single-v4.protocoale.xyz**

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> single-v4.protocoale.xyz
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 30363
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;single-v4.protocoale.xyz.    IN      A

;; ANSWER SECTION:
single-v4.protocoale.xyz. 300      IN      A      127.0.0.1

;; Query time: 39 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Apr 14 13:33:03 EEST 2020
;; MSG SIZE rcvd: 69
```

andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9\$ **dig A single.protocoale.xyz**

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> A single.protocoale.xyz
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 64805
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;single.protocoale.xyz.      IN      A

;; ANSWER SECTION:
single.protocoale.xyz.300    IN      A      127.0.0.1

;; Query time: 68 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Apr 14 14:16:56 EEST 2020
;; MSG SIZE rcvd: 66
```

andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9\$ **dig A multi-v4.protocoale.xyz**

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> A multi-v4.protocoale.xyz
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 21122
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;multi-v4.protocoale.xyz.      IN      A

;; ANSWER SECTION:
multi-v4.protocoale.xyz. 300 IN      A      127.4.4.4
multi-v4.protocoale.xyz. 300 IN      A      127.2.2.2
multi-v4.protocoale.xyz. 300 IN      A      127.3.3.3
multi-v4.protocoale.xyz. 300 IN      A      127.1.1.1

;; Query time: 52 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Apr 14 14:17:29 EEST 2020
;; MSG SIZE rcvd: 116
```

andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9\$ **dig multi.protocoale.xyz**

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> multi.protocoale.xyz
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 43290
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;multi.protocoale.xyz.      IN      A

;; ANSWER SECTION:
multi.protocoale.xyz. 300 IN      A      127.2.2.2
multi.protocoale.xyz. 300 IN      A      127.1.1.1
multi.protocoale.xyz. 300 IN      A      127.4.4.4
multi.protocoale.xyz. 300 IN      A      127.3.3.3

;; Query time: 47 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Apr 14 14:18:31 EEST 2020
;; MSG SIZE rcvd: 113
```

b) Cereri de adresa (AAAA)

andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9\$ **dig AAAA single-v6.protocoale.xyz**

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> AAAA single-v6.protocoale.xyz
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 62620
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;single-v6.protocoale.xyz.      IN      AAAA

;; ANSWER SECTION:
single-v6.protocoale.xyz. 58 IN      AAAA::1

;; Query time: 0 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Apr 14 13:33:32 EEST 2020
;; MSG SIZE rcvd: 81
```

andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9\$ **dig AAAA single.protocoale.xyz**

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> AAAA single.protocoale.xyz
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 58070
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;single.protocoale.xyz.      IN      AAAA

;; ANSWER SECTION:
single.protocoale.xyz. 300 IN      AAAA::1

;; Query time: 58 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Apr 14 14:20:22 EEST 2020
;; MSG SIZE rcvd: 78
```

andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9\$ **dig AAAA multi.protocoale.xyz**

```
>>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> AAAA multi.protocoale.xyz
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 58341
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;multi.protocoale.xyz.      IN      AAAA

;; ANSWER SECTION:
multi.protocoale.xyz. 300    IN      AAAA::4
multi.protocoale.xyz. 300    IN      AAAA::3
multi.protocoale.xyz. 300    IN      AAAA::2
multi.protocoale.xyz. 300    IN      AAAA::1

;; Query time: 60 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Apr 14 14:21:19 EEST 2020
;; MSG SIZE rcvd: 161
```

c) Cerere de tip MX, pentru serverul de mail

andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9\$ **dig MX protocoale.xyz**

```
>>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> MX protocoale.xyz
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 37902
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;protocoale.xyz.          IN      MX

;; ANSWER SECTION:
protocoale.xyz.      81      IN      MX      20 alt2.gmail-smtp-in.l.google.com.
protocoale.xyz.      81      IN      MX      30 alt3.gmail-smtp-in.l.google.com.
protocoale.xyz.      81      IN      MX      10 alt1.gmail-smtp-in.l.google.com.

;; Query time: 15 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Apr 14 14:22:17 EEST 2020
;; MSG SIZE rcvd: 132
```

d) (?) Cerere in care se afiseaza doar RR-urile autoritare

```
andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9$ dig google.com +noall +authority
```

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> google.com +noall +authority
;; global options: +cmd
```

```
andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9$ dig SOA google.com
```

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> SOA google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 18093
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;google.com.                IN      SOA

;; ANSWER SECTION:
google.com.                15      IN      SOA    ns1.google.com. dns-admin.google.com. 306204018
900 900 1800 60

;; Query time: 14 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Apr 14 15:58:32 EEST 2020
;; MSG SIZE rcvd: 89
```

e) Folosirea mai multor servere de nume pentru a interoga adresa IP a google.com

```
andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9$ dig google.com @86.120.141.140
```

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> google.com @86.120.141.140
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 40874
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 13, ADDITIONAL: 1

;; QUESTION SECTION:
;google.com.                IN      A

;; ANSWER SECTION:
google.com.                141     IN      A      172.217.16.110

;; AUTHORITY SECTION:
.                          4860    IN      NS      m.root-servers.net.
```

```
.           4860  IN      NS      d.root-servers.net.
.           4860  IN      NS      k.root-servers.net.
.           4860  IN      NS      e.root-servers.net.
.           4860  IN      NS      a.root-servers.net.
.           4860  IN      NS      g.root-servers.net.
.           4860  IN      NS      i.root-servers.net.
.           4860  IN      NS      h.root-servers.net.
.           4860  IN      NS      c.root-servers.net.
.           4860  IN      NS      b.root-servers.net.
.           4860  IN      NS      j.root-servers.net.
.           4860  IN      NS      f.root-servers.net.
.           4860  IN      NS      l.root-servers.net.
```

```
:: ADDITIONAL SECTION:
```

```
a.root-servers.net. 169421      IN      A      198.41.0.4
```

```
:: Query time: 154 msec
```

```
:: SERVER: 86.120.141.140#53(86.120.141.140)
```

```
:: WHEN: Tue Apr 14 14:34:23 EEST 2020
```

```
:: MSG SIZE rcvd: 271
```

```
andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9$ dig google.com @8.8.8.8
```

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> google.com @8.8.8.8
```

```
:: global options: +cmd
```

```
:: Got answer:
```

```
:: ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 60126
```

```
:: flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
```

```
:: OPT PSEUDOSECTION:
```

```
:: EDNS: version: 0, flags:; udp: 512
```

```
:: QUESTION SECTION:
```

```
;google.com.      IN      A
```

```
:: ANSWER SECTION:
```

```
google.com.      201     IN      A      172.217.20.14
```

```
:: Query time: 26 msec
```

```
:: SERVER: 8.8.8.8#53(8.8.8.8)
```

```
:: WHEN: Tue Apr 14 14:33:20 EEST 2020
```

```
:: MSG SIZE rcvd: 55
```

```
andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9$ dig google.com @81.180.124.165
```

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> google.com @81.180.124.165
```

```
:: global options: +cmd
```

```
:: Got answer:
```

```
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 47680
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 4, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
google.com.                IN      A

;; ANSWER SECTION:
google.com.                300     IN      A      172.217.165.14

;; AUTHORITY SECTION:
google.com.                138536  IN      NS      ns2.google.com.
google.com.                138536  IN      NS      ns3.google.com.
google.com.                138536  IN      NS      ns4.google.com.
google.com.                138536  IN      NS      ns1.google.com.

;; Query time: 50 msec
;; SERVER: 81.180.124.165#53(81.180.124.165)
;; WHEN: Tue Apr 14 14:37:30 EEST 2020
;; MSG SIZE rcvd: 127
```

f) Interogare bulk

```
andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9$ dig -f queries.txt +noall +answer
google.com.          17      IN      A      172.217.20.14
facebook.com.        71      IN      A      185.60.218.35
twitter.com.         735     IN      A      104.244.42.129
twitter.com.         735     IN      A      104.244.42.193
```

g) Folosirea optiunii de tracing

```
andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9$ dig test.dorinel.protocoale.xy
+noall +answer +trace
```

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> test.dorinel.protocoale.xy +noall +answer +trace
;; global options: +cmd
;; Received 51 bytes from 127.0.0.53#53(127.0.0.53) in 0 ms
```

```
andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9$ dig protocoale.xyz +noall
+answer +trace
```

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> protocoale.xyz +noall +answer +trace
;; global options: +cmd
;; Received 51 bytes from 127.0.0.53#53(127.0.0.53) in 0 ms
```

```
andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9$ dig dorinel.protocoale.xyz
+noall +answer +trace
```

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> dorinel.protocoale.xyz +noall +answer +trace
;; global options: +cmd
;; Received 51 bytes from 127.0.0.53#53(127.0.0.53) in 0 ms
```

h) Cautare inversa (PTR) pentru o adresa IP

andreea@andreea-ubuntu:~/Desktop/PROTOCOALE/laburi/lab9\$ **dig -x 172.217.20.14 +noall +answer**

```
; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> -x 172.217.20.14 +noall +answer
```

```
;; global options: +cmd
```

```
14.20.217.172.in-addr.arpa. 11569 IN PTR bud02s28-in-f14.1e100.net.
```

```
14.20.217.172.in-addr.arpa. 11569 IN PTR ham02s13-in-f14.1e100.net.
```

I) Vizualizare cerere si raspuns DNS din Wireshark

Ma 16:07
dns_capture.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
29	1.227305035	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.226.146? Tell 10.243.224.1
30	1.227324689	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.224.79? Tell 10.243.224.1
31	1.227329514	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.226.79? Tell 10.243.224.1
32	1.229583336	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.225.118? Tell 10.243.224.1
33	1.229602292	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.225.47? Tell 10.243.224.1
34	1.329732708	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.225.80? Tell 10.243.224.1
35	1.329751145	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.226.181? Tell 10.243.224.1
36	1.329755388	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.227.119? Tell 10.243.224.1
37	1.330874440	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.224.23? Tell 10.243.224.1
38	1.361727987	2a02:2f0e:c407:d500...	2a02:2f0e:8000:3::1	DNS	111	Standard query 0x7f75 PTR 8.8.8.8.in-addr.arpa OPT
39	1.375751839	2a02:2f0e:8000:3::1	2a02:2f0e:c407:d500...	DNS	135	Standard query response 0x7f75 PTR 8.8.8.8.in-addr.arpa PTR dns.google OPT
40	1.382810754	2a02:2f0e:c407:d500...	2a02:2f0e:8000:3::1	DNS	123	Standard query 0x77fa A r4---sn-c0q7lnsl.googlevideo.com OPT
41	1.382963745	2a02:2f0e:c407:d500...	2a02:2f0e:8000:3::1	DNS	123	Standard query 0x02e3 AAAA r4---sn-c0q7lnsl.googlevideo.com OPT
42	1.391333871	2a02:2f0e:8000:3::1	2a02:2f0e:c407:d500...	DNS	168	Standard query response 0x77fa A r4---sn-c0q7lnsl.googlevideo.com CNAME r4.sn-c0q7lnsl.googlevideo.com A 74.125.173.105 0
43	1.391352680	2a02:2f0e:8000:3::1	2a02:2f0e:c407:d500...	DNS	180	Standard query response 0x02e3 AAAA r4---sn-c0q7lnsl.googlevideo.com CNAME r4.sn-c0q7lnsl.googlevideo.com AAAA 2a00:1450:
44	1.393545083	2a02:2f0e:c407:d500...	2a00:1450:400d:13::9	UDP	1392	43479 → 443 Len=1330
45	1.393790225	2a02:2f0e:c407:d500...	2a00:1450:400d:13::9	UDP	1168	43479 → 443 Len=1106
46	1.421475165	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	1392	443 → 43479 Len=1330
47	1.424601963	2a02:2f0e:c407:d500...	2a00:1450:400d:13::9	UDP	1392	43479 → 443 Len=1330
48	1.424743245	2a02:2f0e:c407:d500...	2a00:1450:400d:13::9	UDP	1168	43479 → 443 Len=1106
49	1.431035489	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.227.48? Tell 10.243.224.1
50	1.431061884	IntelCor_8e:64:f0	Broadcast	ARP	56	Who has 10.243.226.120? Tell 10.243.224.1
51	1.448452230	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	98	443 → 43479 Len=36
52	1.449900450	2a02:2f0e:c407:d500...	2a00:1450:400d:13::9	UDP	98	43479 → 443 Len=36
53	1.453684489	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	1392	443 → 43479 Len=1330
54	1.453716996	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	85	443 → 43479 Len=23
55	1.454539938	2a02:2f0e:c407:d500...	2a00:1450:400d:13::9	UDP	90	43479 → 443 Len=28
56	1.467830680	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	85	443 → 43479 Len=23
57	1.467864935	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	789	443 → 43479 Len=727
58	1.467879802	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	1392	443 → 43479 Len=1330
59	1.467885954	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	1392	443 → 43479 Len=1330
60	1.468339704	2a02:2f0e:c407:d500...	2a00:1450:400d:13::9	UDP	90	43479 → 443 Len=28
61	1.469401822	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	1392	443 → 43479 Len=1330
62	1.469421389	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	1392	443 → 43479 Len=1330
63	1.469428437	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	1392	443 → 43479 Len=1330
64	1.469434158	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	1392	443 → 43479 Len=1330
65	1.469440638	2a00:1450:400d:13::9	2a02:2f0e:c407:d500...	UDP	1392	443 → 43479 Len=1330

Frame 1: 78 bytes on wire (624 bits), 78 bytes captured (624 bits) on interface 0
Ethernet II, Src: HuaweiTe_57:19:e8 (44:6a:2e:57:19:e8), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
Data (64 bytes)

0000 ff ff ff ff ff ff 44 6a 2e 57 19 e8 99 9a 44 6aDj .W....Dj
0010 2e 57 19 e4 ff ff ff ff 00 00 00 09 63 bc a5 db .W.....C...
0020 00 00 00 00 00 00 00 00 ff ff ff ff 01 1a 49I
0030 0a dc 0a 70 56 7f d2 0e 96 72 02 02 01 00 6b 82 ...pV...r....k.
0040 3c 31 38 36 3e 41 70 72 20 31 34 20 32 30 <18>Apr 14 20

dns_capture.pcapng Packets: 524 · Displayed: 524 (100.0%) Profile: Default