

1)

rskelly@Jon-Snow:~\$ dig

```
; <<>> DiG 9.16.1-Ubuntu <<>>
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 45947
;; flags: qr rd ad; QUERY: 1, ANSWER: 26, AUTHORITY: 0, ADDITIONAL: 0
;; WARNING: recursion requested but not available

;; QUESTION SECTION:
;                IN      NS

;; ANSWER SECTION:
.                0      IN      NS      l.root-servers.net.
.                0      IN      NS      m.root-servers.net.
.                0      IN      NS      j.root-servers.net.
.                0      IN      NS      b.root-servers.net.
.                0      IN      NS      c.root-servers.net.
.                0      IN      NS      a.root-servers.net.
.                0      IN      NS      h.root-servers.net.
.                0      IN      NS      f.root-servers.net.
.                0      IN      NS      i.root-servers.net.
.                0      IN      NS      e.root-servers.net.
.                0      IN      NS      d.root-servers.net.
.                0      IN      NS      g.root-servers.net.
.                0      IN      NS      k.root-servers.net.
j.root-servers.net. 0      IN      A       192.58.128.30
j.root-servers.net. 0      IN      AAAA    2001:503:c27::2:30
b.root-servers.net. 0      IN      A       199.9.14.201
b.root-servers.net. 0      IN      AAAA    2001:500:200::b
c.root-servers.net. 0      IN      A       192.33.4.12
c.root-servers.net. 0      IN      AAAA    2001:500:2::c
a.root-servers.net. 0      IN      A       198.41.0.4
a.root-servers.net. 0      IN      AAAA    2001:503:ba3e::2:30
h.root-servers.net. 0      IN      A       198.97.190.53
h.root-servers.net. 0      IN      AAAA    2001:500:1::53
f.root-servers.net. 0      IN      A       192.5.5.241
f.root-servers.net. 0      IN      AAAA    2001:500:2f::f
i.root-servers.net. 0      IN      A       192.36.148.17

;; Query time: 0 msec
;; SERVER: 172.31.128.1#53(172.31.128.1)
;; WHEN: Sun Oct 02 19:00:15 EDT 2022
```

:: MSG SIZE rcvd: 838

rskelly@Jon-Snow:~\$ dig ryanskelly.com @192.58.128.30

; <<>> DiG 9.16.1-Ubuntu <<>> ryanskelly.com @192.58.128.30

:: global options: +cmd

:: Got answer:

:: ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 13738

:: flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 13, ADDITIONAL: 27

:: WARNING: recursion requested but not available

:: OPT PSEUDOSECTION:

; EDNS: version: 0, flags:: udp: 4096

:: QUESTION SECTION:

;ryanskelly.com. IN A

:: AUTHORITY SECTION:

com.	172800	IN	NS	e.gtld-servers.net.
com.	172800	IN	NS	b.gtld-servers.net.
com.	172800	IN	NS	j.gtld-servers.net.
com.	172800	IN	NS	m.gtld-servers.net.
com.	172800	IN	NS	i.gtld-servers.net.
com.	172800	IN	NS	f.gtld-servers.net.
com.	172800	IN	NS	a.gtld-servers.net.
com.	172800	IN	NS	g.gtld-servers.net.
com.	172800	IN	NS	h.gtld-servers.net.
com.	172800	IN	NS	l.gtld-servers.net.
com.	172800	IN	NS	k.gtld-servers.net.
com.	172800	IN	NS	c.gtld-servers.net.
com.	172800	IN	NS	d.gtld-servers.net.

:: ADDITIONAL SECTION:

e.gtld-servers.net.	172800	IN	A	192.12.94.30
e.gtld-servers.net.	172800	IN	AAAA	2001:502:1ca1::30
b.gtld-servers.net.	172800	IN	A	192.33.14.30
b.gtld-servers.net.	172800	IN	AAAA	2001:503:231d::2:30
j.gtld-servers.net.	172800	IN	A	192.48.79.30
j.gtld-servers.net.	172800	IN	AAAA	2001:502:7094::30
m.gtld-servers.net.	172800	IN	A	192.55.83.30
m.gtld-servers.net.	172800	IN	AAAA	2001:501:b1f9::30
i.gtld-servers.net.	172800	IN	A	192.43.172.30
i.gtld-servers.net.	172800	IN	AAAA	2001:503:39c1::30
f.gtld-servers.net.	172800	IN	A	192.35.51.30
f.gtld-servers.net.	172800	IN	AAAA	2001:503:d414::30

```
a.gtld-servers.net. 172800 IN A 192.5.6.30
a.gtld-servers.net. 172800 IN AAAA 2001:503:a83e::2:30
g.gtld-servers.net. 172800 IN A 192.42.93.30
g.gtld-servers.net. 172800 IN AAAA 2001:503:eea3::30
h.gtld-servers.net. 172800 IN A 192.54.112.30
h.gtld-servers.net. 172800 IN AAAA 2001:502:8cc::30
l.gtld-servers.net. 172800 IN A 192.41.162.30
l.gtld-servers.net. 172800 IN AAAA 2001:500:d937::30
k.gtld-servers.net. 172800 IN A 192.52.178.30
k.gtld-servers.net. 172800 IN AAAA 2001:503:d2d::30
c.gtld-servers.net. 172800 IN A 192.26.92.30
c.gtld-servers.net. 172800 IN AAAA 2001:503:83eb::30
d.gtld-servers.net. 172800 IN A 192.31.80.30
d.gtld-servers.net. 172800 IN AAAA 2001:500:856e::30
```

```
:: Query time: 30 msec
:: SERVER: 192.58.128.30#53(192.58.128.30)
:: WHEN: Sun Oct 02 19:00:54 EDT 2022
:: MSG SIZE rcvd: 839
```

rskelly@Jon-Snow:~\$ dig ryanskelly.com @192.12.94.30

```
; <<>> DiG 9.16.1-Ubuntu <<>> ryanskelly.com @192.12.94.30
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 57493
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 2, ADDITIONAL: 3
;; WARNING: recursion requested but not available
```

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

```
:: AUTHORITY SECTION:
ryanskelly.com. 172800 IN NS ns1.dotster.com.
ryanskelly.com. 172800 IN NS ns2.dotster.com.
```

```
:: ADDITIONAL SECTION:
ns1.dotster.com. 172800 IN A 66.96.142.146
ns2.dotster.com. 172800 IN A 65.254.254.170
```

```
:: Query time: 20 msec
;; SERVER: 192.12.94.30#53(192.12.94.30)
```

:: WHEN: Sun Oct 02 19:01:26 EDT 2022

:: MSG SIZE rcvd: 119

rskelly@Jon-Snow:~\$ dig ryanskelly.com @66.96.142.146

; <<>> DiG 9.16.1-Ubuntu <<>> ryanskelly.com @66.96.142.146

:: global options: +cmd

:: Got answer:

:: ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 15639

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

:: WARNING: recursion requested but not available

:: OPT PSEUDOSECTION:

; EDNS: version: 0, flags:; udp: 1232

:: QUESTION SECTION:

;ryanskelly.com. IN A

:: ANSWER SECTION:

ryanskelly.com. 3600 IN A **66.96.149.25**

:: Query time: 20 msec

:: SERVER: **66.96.142.146**#53(66.96.142.146)

:: WHEN: Sun Oct 02 19:02:17 EDT 2022

:: MSG SIZE rcvd: 59

rskelly@Jon-Snow:~\$

2)

. 518400 IN NS j.root-servers.net.

Initial Host name

j.root-servers.net. 518400 IN A 192.58.128.30

TLD IP

e.gtld-servers.net. 172800 IN A 192.12.94.30

Next under 192.58.128.30

This was where my search concluded as there wasn't a listing for ns1.dotster.com. under the root.zone file

3)

root@Jon-Snow:/home/rskelly# traceroute 192.58.128.30

traceroute to 192.58.128.30 (192.58.128.30), 30 hops max, 60 byte packets

1 Jon-Snow.mshome.net (172.31.128.1) 0.278 ms 0.259 ms 0.251 ms

```
2 10.0.0.1 (10.0.0.1) 5.663 ms 6.725 ms 10.918 ms
3 96.120.70.25 (96.120.70.25) 21.142 ms 25.175 ms 24.447 ms
4 96.108.59.177 (96.108.59.177) 21.919 ms 23.309 ms 23.728 ms
5 96.108.158.197 (96.108.158.197) 27.488 ms 28.006 ms 24.079 ms
6 162.151.151.225 (162.151.151.225) 22.380 ms 27.976 ms 27.315 ms
7 162.151.150.125 (162.151.150.125) 31.315 ms * *
8 162.151.52.34 (162.151.52.34) 21.359 ms 162.151.52.50 (162.151.52.50) 21.733 ms
20.851 ms
9 * * *
10 4.69.148.33 (4.69.148.33) 27.866 ms 33.426 ms 32.976 ms
11 4.7.5.174 (4.7.5.174) 37.308 ms 94.436 ms 93.923 ms
```

^^^This traceroute was run on my local machine, using:

Jon-Snow.mshome.net (172.31.128.1) -> 10.0.0.1 (10.0.0.1) -> 96.120.70.25 (96.120.70.25)

```
core2.abq1.he.net> traceroute 192.58.128.30 source 216.218.252.70
traceroute to 192.58.128.30 (192.58.128.30), 30 hops max, 60 byte packets
```

```
1 * * *
```

```
2 * * *
```

```
3 192.58.128.30 (192.58.128.30) 10.988 ms 11.158 ms 11.281 ms
```

^^^This traceroute was run using Hurricane Electric's [H5 Data Centers ABQ 1, Albuquerque] host, as you can see, this location was able to find a host with that address(although its not a listing with the corresponding 'j.root-servers.net' HN), another odd effect is it getting the listing on the first hop

```
core2.bos1.he.net> traceroute 192.58.128.30 source 216.218.253.32
traceroute to 192.58.128.30 (192.58.128.30), 30 hops max, 60 byte packets
```

```
1 * * *
```

```
2 * * *
```

```
3 ge-0-1-0.r1.bb-fo.nyc3.vrsn.net (198.32.160.193) 6.602 ms 7.398 ms 7.468 ms
```

```
4 209.131.139.127 (209.131.139.127) 18.518 ms 18.650 ms 18.775 ms
```

```
5 j.root-servers.net (192.58.128.30) 6.625 ms 7.948 ms 7.732 ms
```

^^^This traceroute was run Hurricane Electric's [One Summer Boston] host and this host successfully resolved the j.root-servers.net in 3 hops

4)

1. What is the name of the program that initiated the network traffic captured in the trace?
 - a. This was done by a web browser, resolving and fetching resources from unh.edu
2. What is the hostname of the machine where the command was executed?
 - a. unh.edu
3. What type of a query did the client make? Was an IPv6 address requested?
 - a. No, in the capture the client requested the HTTP webpage from the nginx server, and it performed a HEAD request
4. How long did the name resolution (DNS) take?
 - a. ~0.0005s or 5.82ms
5. Was the DNS response authoritative?
 - a. No, it was non-authoritative judging by the A bit in the response
6. Was the client successful in retrieving the content?
 - a. No, the resource that was requested was permanently moved, based on the HTTP 301 response code

#U: python3 asn02.py <Resource URL>

#A: Ryan J. Skelly D: 10/3/22 Pro: asn02.py, Naive Resource downloader(Only works with PDF, JPG, PNG, and other 'byte' files)

#Pur: Testing the throughput of a HTTP request/response exchange as well as the time it takes between the response and download

#E: rjs1070@wildcats.unh.edu

#N: I didn't see it explicitly stated anywhere in the directions to make this assignment general(work for HTML, JSON, TXT) so I made it Naive to reflect the example:

#[rbartos@agate ~]\$./a2 http://www.cs.unh.edu/~cs725/notes/cs725-fall-2022-04.pdf, if this was a requirement of this Asn please let me know ASAP!

import requests

import sys

import time

url = sys.argv[1]

start = float(time.time())*1000.0 # sec -> ms

with requests.get(url) as r:

body = float(time.time())*1000.0 # sec -> ms

with open(url.split("/")[-1], 'wb') as f:

f.write(r.content) #Implied PDF, IMG, or other 'bytes' file

```
end = float(time.time())*1000.0 # sec -> ms
print('File Size :', (float(r.headers['Content-Length'])/1000.0),'kb') # b -> kb
print('Time Elapsed from Request->Response :', round(body - start, 4), 'ms')
print('Time Elapsed from Response->Write to file :', round(end - body, 4), 'ms')
print('Overall Throughput of Request->Response :',
round((float(r.headers['Content-Length'])/1000.0) / ((body - start)/1000.0), 4), 'kbits/s') # b -> kb,
ms -> s
print('Overall Throughput of Total Download (Request->Write to file) :',
round((float(r.headers['Content-Length'])/1000.0) / ((end - start)/1000.0), 4), 'kbits/s') # b -> kb,
ms -> s
```

SAMPLE RUNS

```
(rskelly@LAPTOP-RLMT89M8)-[~]
$ python3 asn02.py http://www.cs.unh.edu/~cs725/notes/cs725-fall-2022-04.pdf
File Size : 644.648 kb
Time Elapsed from Request->Response : 399.2517 ms
Time Elapsed from Response->Write to file : 1.5559 ms
Overall Throughput of Request->Response : 1614.6406 kbits/s
Overall Throughput of Total Download (Request->Write to file) : 1608.3726 kbits/s
```

```
(rskelly@LAPTOP-RLMT89M8)-[~]
$ python3 asn02.py
https://imagesvc.meredithcorp.io/v3/mm/image?url=https%3A%2F%2Fstatic.onecms.io%2Fwp-content%2Fuploads%2Fsites%2F6%2F2020%2F01%2Fslowpoke-2000.jpg
File Size : 199.414 kb
Time Elapsed from Request->Response : 335.1462 ms
Time Elapsed from Response->Write to file : 1.0051 ms
Overall Throughput of Request->Response : 595.0059 kbits/s
Overall Throughput of Total Download (Request->Write to file) : 593.2268 kbits/s
```

```
(rskelly@LAPTOP-RLMT89M8)-[~]
$ python3 asn02.py https://www.unh.edu/sites/default/files/media/logo_vert_outline.png
File Size : 22.978 kb
Time Elapsed from Request->Response : 263.936 ms
Time Elapsed from Response->Write to file : 0.6238 ms
Overall Throughput of Request->Response : 87.059 kbits/s
Overall Throughput of Total Download (Request->Write to file) : 86.8537 kbits/s
```