

# 6.033 Lecture 14

## DNS and Content Delivery Networks

Sam Madden

Key ideas:

- Domain name service

- Content delivery networks

- Network overlays

# The “dig” Command

dig csail.mit.edu

“Time to Live” (TTL)

Type of record

A = “Address”

NS = “Name server”

;; QUESTION SECTION:

;csail.mit.edu.

IN A

*The question we asked*

;; ANSWER SECTION:

csail.mit.edu.

5921 IN A 128.30.2.121

*The answer*

;; AUTHORITY SECTION:

csail.mit.edu. 15152 IN NS AUTH-NS0.csail.mit.edu.

csail.mit.edu. 15152 IN NS AUTH-NS1.csail.mit.edu.

csail.mit.edu. 15152 IN NS AUTH-NS2.csail.mit.edu.

csail.mit.edu. 15152 IN NS AUTH-NS3.csail.mit.edu.

*Servers  
that  
can  
answer  
the  
question*

This video has been downloaded 30 million times



# graphics8.nytimes.com from T-Mobile Cell Phone

```
-bash ~ % dig graphics8.nytimes.com
```

```
; <<>> DiG 9.4.2-P2 <<>> graphics8.nytimes.com
```

```
;; global options: printcmd
```

```
;; Got answer:
```

```
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 27018
```

```
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 0
```

```
;; QUESTION SECTION:
```

```
;graphics8.nytimes.com.          IN  A
```

```
;; ANSWER SECTION:
```

```
graphics8.nytimes.com. 281 IN  CNAME graphics478.nytimes.com.edgesuite.net.
```

```
graphics478.nytimes.com.edgesuite.net. 13964 IN  CNAME a1116.x.akamai.net.
```

```
a1116.x.akamai.net.      5   IN  A    8.17.64.78
```

```
a1116.x.akamai.net.      5   IN  A    8.17.64.24
```

# graphics8.nytimes.com from T-Mobile Cell Phone

```
-bash ~ % traceroute 8.17.64.78
traceroute to 8.17.64.78 (8.17.64.78), 64 hops max, 40 byte packets
 1 158.15.184.10.in-addr.arpa (10.184.15.158) 2325.487 ms * *
 2 * * 178.15.184.10.in-addr.arpa (10.184.15.178) 3768.802 ms
 3 226.1.184.10.in-addr.arpa (10.184.1.226) 2230.431 ms 1706.115 ms 4265.992
ms
 4 33.96.184.10.in-addr.arpa (10.184.96.33) 3022.872 ms 2085.019 ms 1003.134
ms
 5 m8e065e42.tmodns.net (66.94.6.142) 494.165 ms 1096.573 ms 1043.394 ms
 6 209.96.184.10.in-addr.arpa (10.184.96.209) 544.710 ms 300.269 ms 520.475 ms
 7 220.96.184.10.in-addr.arpa (10.184.96.220) 460.470 ms 916.142 ms 523.900 ms
 8 * * *
 9 ge-6-20.car1.Atlanta1.Level3.net (4.79.213.49) 2439.082 ms 2411.253 ms
2501.724 ms
10 ae-27-52.car1.Atlanta4.Level3.net (4.68.103.44) 2039.606 ms 3383.729 ms
3697.863 ms
11 8.17.64.78 (8.17.64.78) 3862.096 ms 2918.443 ms 600.868 ms
```

dig google.com

ANSWER SECTION:

google.com. 282 IN A 209.85.171.100

google.com. 282 IN A 74.125.45.100

google.com. 282 IN A 74.125.67.100