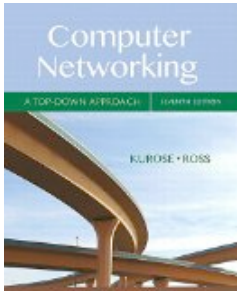
COMP 375: Lecture 08



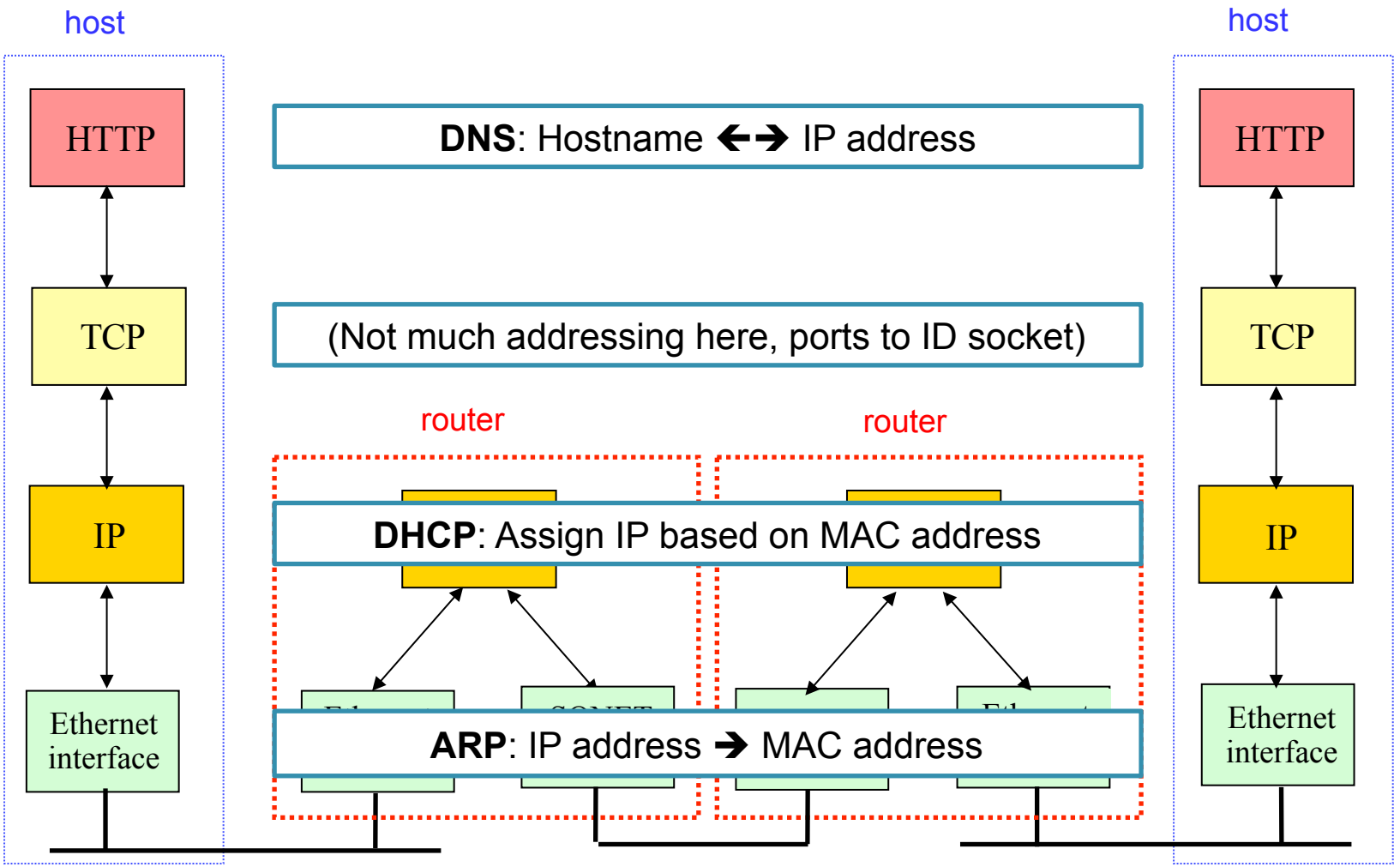
- **News & Notes:**
  - Happy Valentine's Day!
  - Quiz #2 in class Friday
  - Project #2 due Feb. 28 (two weeks)
- **Reading (Fri, Feb. 16)**
  - Review Section 2.4 (DNS)

Intro Discussion

A non-CS friend asks you why we need DNS.

What do you tell them?

Specialized protocols handle names at various layers.



Section 2.4

DOMAIN NAME SERVICE (DNS)

What's the biggest challenge for DNS?

A.	It's old.
B.	The fact that the Internet is global.
C.	The fact that DNS is now critical infrastructure.
D.	The sheer number of name lookups happening at any given time.
E.	How and when the name to IP address mapping should change.

Before 1998, one man was in charge of domain name mappings.

Joe Postel: USC Researcher, Head of IANA

But today a private, non-profit is in charge of naming.

As of 2014

VERISIGN™

Should the US/ICANN retain control of DNS or let the UN take care of it?

A.	NTIA and ICANN
B.	ICANN Only
C.	The United Nations
D.	Someone else

DNS provides more than just hostname to IP mapping.

- Hostname to IP address translation
- Hostname aliasing
- Mail server aliasing
- Load distribution
- Others…
  - Wikipedia: List of DNS record types

DNS uses a single record format for its DB, but each record has a specific type.

RR format: **(name, value, type, TTL)**

Type: A

- **name**: hostname
- **value**: IP address

Type: NS

- **name**: domain (e.g., foo.com)
- **value**: hostname of authoritative name server for this domain

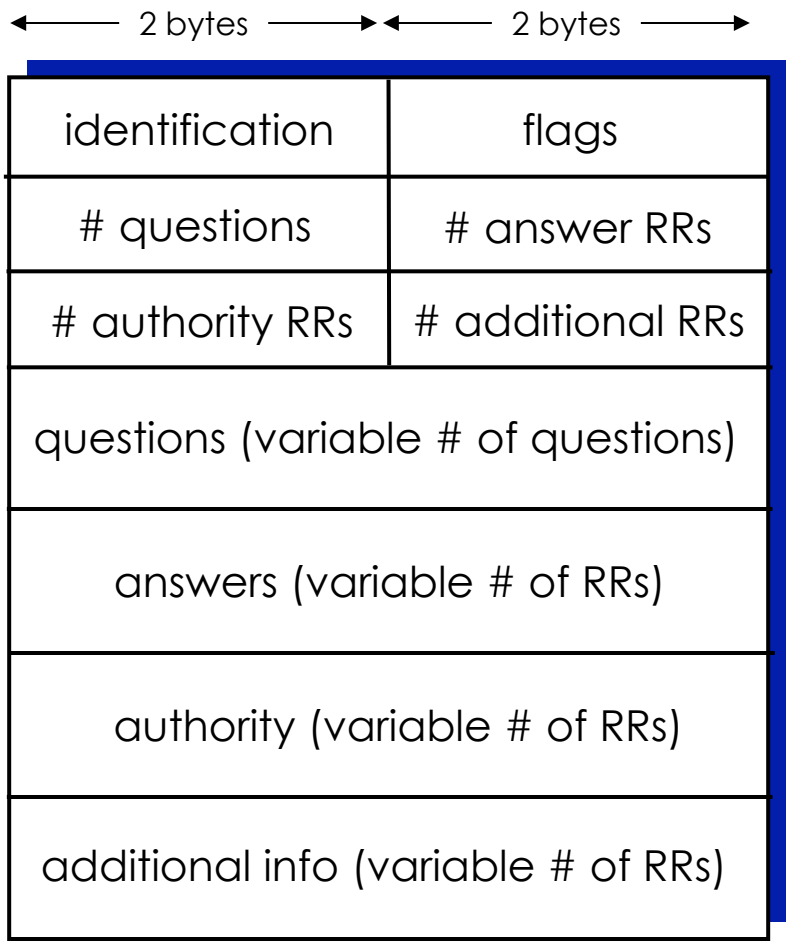
Type: CNAME

- **name**: alias name for some *canonical* name
- **value:** canonical name

Type: MX

- **name:** hostname
- **value**: name of associated mailserver

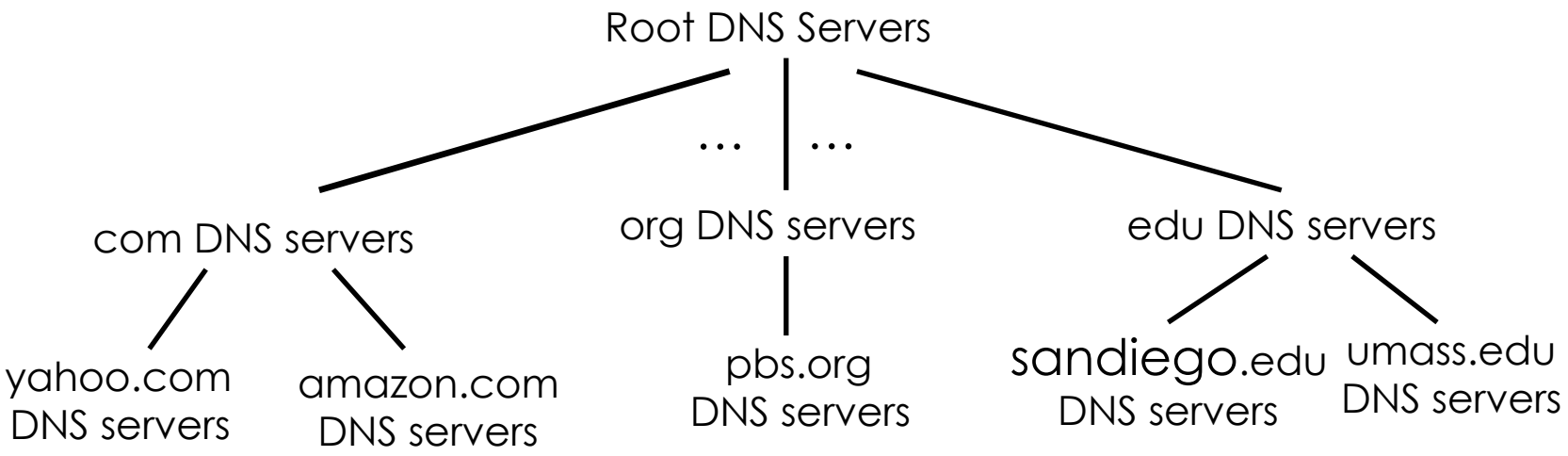
DNS uses a single message format for queries and replies.



DNS is *distributed* and *hierarchical*.

What does that mean?

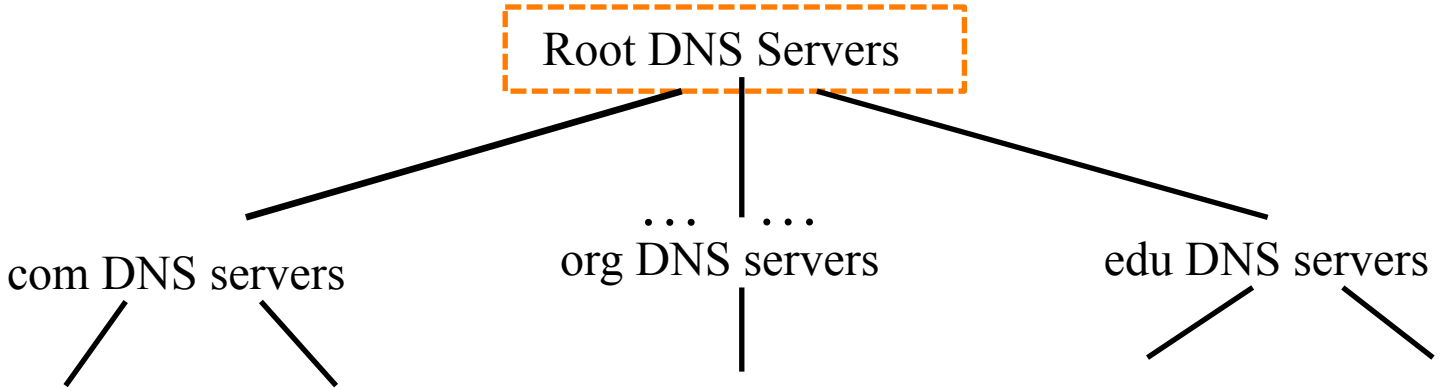
Deeper layers of the hierarchy contain more fine-grained details.

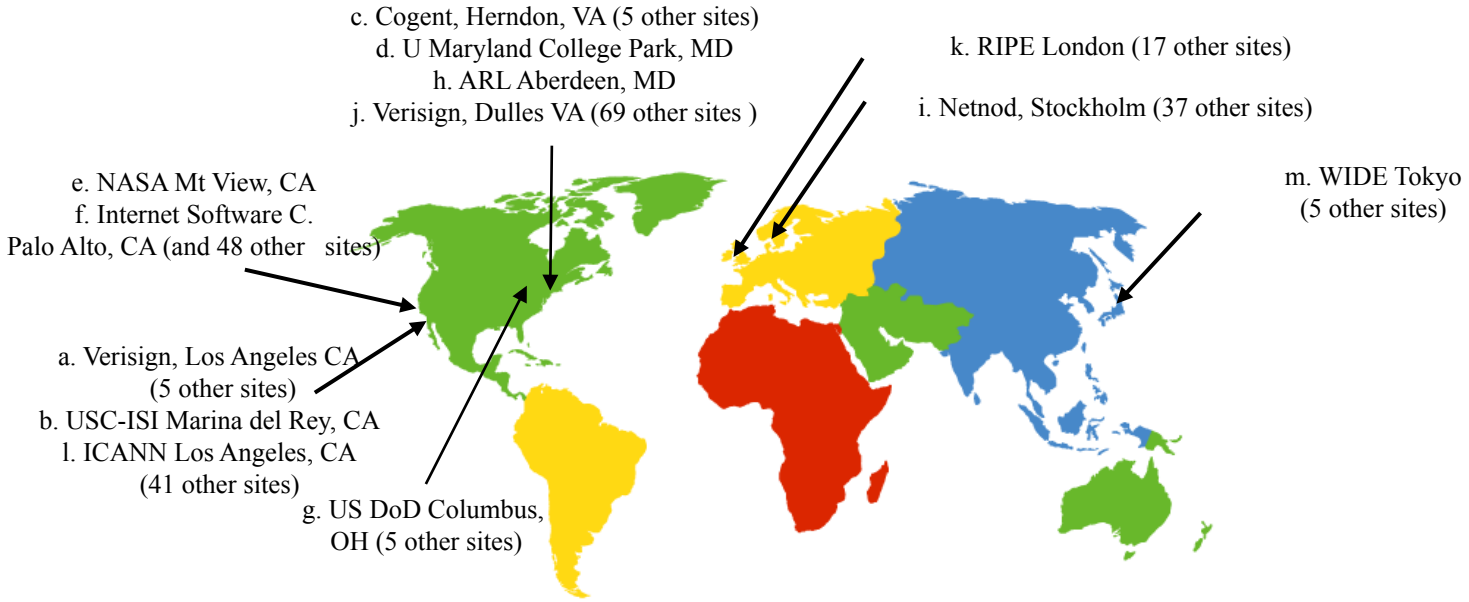


Why Not Use A Central DNS Server?

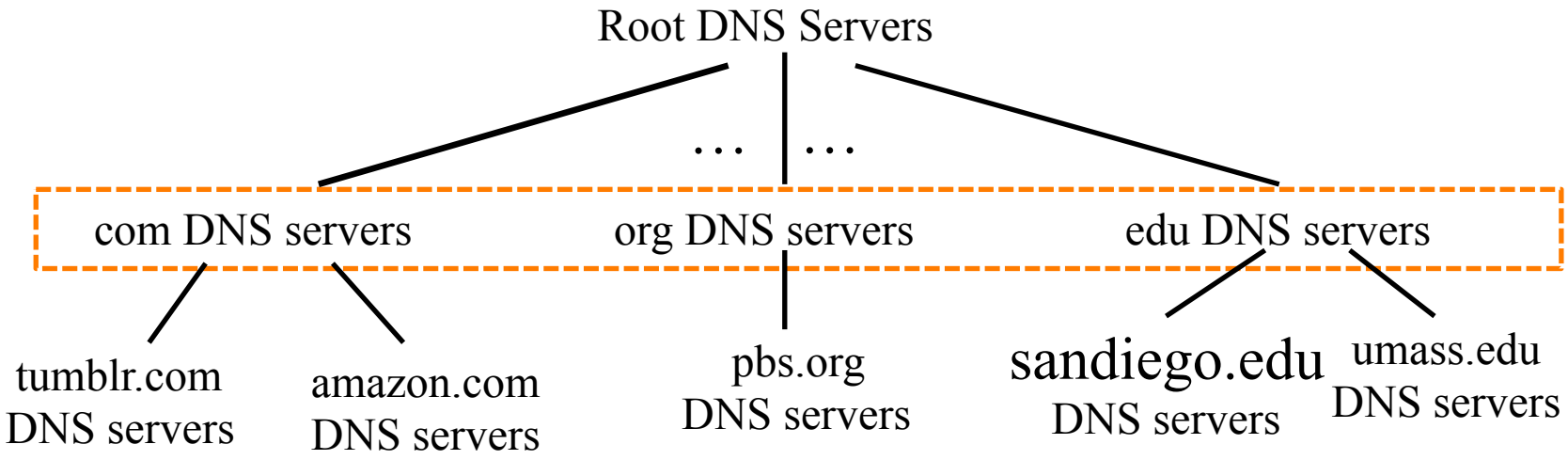
A.	Too much traffic
B.	Too vulnerable to attack
C.	More latency for those far away
D.	Exactly 2 of the above
E.	All of the above (i.e. A, B, and C)

13 DNS root servers track authorities on top-level domains (e.g. .com).





TLD servers track the authority on specific domains (e.g. foo.edu).



Authoritative servers track the IP addresses of hosts in an organization.