

CSE 222

Graduate Networking

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Lecture 9: DNS

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What's in a name?

- Domain Name System
 - ♦ Classic example of a distributed system
 - ♦ That works
 - ♦ That we rely upon for almost every application
 - ♦ And that actually scales to the size of the Internet

Caching

- “Positive” caching
 - Cache results
 - Loosely consistent: No way to invalidate
- Negative caching – cache the result of failed queries
 - Buggy resolver implementations

Lookups

- Forward: FQDN → IP address
 - alpenglow.ucsd.edu → 132.239.15.26
- Reverse: IP address → FQDN
 - Use in-addr.arpa hierarchy
 - 26.15.239.132.in-addr.arpa -> alpenglow.ucsd.edu

Discussion

- How has DNS been used to create a billion dollar company?
- At the time of this paper ('88), there were 20,000 hosts and 7 root name servers
 - ♦ How many root name servers do you think there are today?
- DNS is a scalable, global namespace for hosts in the Internet
 - ♦ What is another naming problem that we face today that has even worse scaling problem?
 - ♦ Which mechanism do you think has been proposed to solve it?

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Discussion (2)

- Security
 - ♦ Another concern of mine is the security put into DNS. Did they think about what security risks there are to DNS?
→ Secure DNS
- Scalability
 - ♦ The user-level mail binding mentioned surprised me. They were designing a protocol to replace a system that couldn't scale and they seem to be discussing adding user mail addresses to zone info which wouldn't scale. As the number of users on systems increased, the zone files would have been way too large to manage. Imagine yahoo.com's or hotmail.com's zone if each user's mailname was listed in it.

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Discussion (3)

- Another thorny problem – Internationalization
 - Could be the straw that breaks DNS's back

For Next Time...

- kc claffy and David Moore will be guest lecturing on Internet measurement
- Note that you only need to do one eval for all of k's papers in the reading list (which are relatively short)