the domain name system

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pinging machines

[chim:~] dnj% ping google.com
PING google.com (173.194.43.35): 56 data bytes
64 bytes from 173.194.43.35: icmp_seq=0 ttl=251 time=15.752 ms
64 bytes from 173.194.43.35: icmp_seq=1 ttl=251 time=19.017 ms
^C

--- google.com ping statistics ---
2 packets transmitted, 2 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 15.752/17.384/19.017/1.633 ms

[chim:~] dnj% ping mit.edu
PING mit.edu (18.9.22.69): 56 data bytes
64 bytes from 18.9.22.69: icmp_seq=0 ttl=252 time=19.229 ms
64 bytes from 18.9.22.69: icmp_seq=1 ttl=252 time=19.099 ms
^C

--- mit.edu ping statistics ---
2 packets transmitted, 2 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 19.099/19.164/19.229/0.065 ms

[chim:~] dnj%
using IP addresses in URLs?
why domain names?

user friendly
› no need to remember IP address

load balancing
› same name maps to changing IP address

decoupling
› can move server to different network, ISP, etc
hierarchical structure

ru.wikipedia.org.
central directory service model

Photograph of rows of cubicles and computers removed due to copyright restrictions.
1. Browser asks your ISP name server for the domain's IP address.
2. If your ISP name server doesn’t know, it then asks the root name server where to find the authoritative name server for the domain.
3. The ISP name server then asks for the IP address from the authoritative name server.
4. The authoritative name server then sends the IP address back to the ISP name server.
5. The ISP name server then sends the IP address back to the browser.
6. Browser uses IP to request web page from x.com’s website server.
7. x.com’s website server sends web page to browser.

Image by MIT OpenCourseWare.
more details

recursive and non-recursive lookups
› recursive: server fully answers query
› non-recursive: sends back name of next server

glue records
› query returns name of server, so need to resolve that
› what if server is in domain being queried?
› glue record: provides IP address is this case

about 40 record types
› A: most common; returns IP for domain name
› CNAME: alias to another domain name
things to know about

caching
› name server holds records it heard about from others
› no explicit invalidation; records expire
› so causes delay when name changes

replication
› 80 replicas of root name server (2008)

registrars
› decentralized since 1999
› registrar causes delay too

where can I learn more?
› 6033!
R.I.P Aaron Swartz
Hacked by grand wizard of Luizsec, Sabu
GOD BLESS AMERICA
DOWN WITH ANONYMOUS

I used to think I was a pretty good person. I certainly didn’t kill people, for example. But then Peter Singer pointed out that animals were conscious and that eating them led them to be killed and that wasn’t all that morally different from killing people after all. So I became a vegetarian. Again I thought I was a pretty good person. But then Arianna Huffington told me that by driving in a car I was pouring toxic fumes into the air and sending money to foreign dictators. So I got a bike instead. But then I realized that my bike seat was sewn by children in foreign sweatshops while its tubing was made by mining metals through ripping up the earth. Indeed, any money I spend on food, clothes, or anything else is a part of the destruction of the planet in one way or another. And I happen to make money some of it goes to the government. In Afghanistan or Iraq, I thought about just living off of stamps I found in dumpsters, like some friends. That way I wouldn’t support military spending or production. But then I realized that some people buy the things they can’t find in dumpsters, if I got to the dumpsters they might buy it instead. The solution seemed clean I’d have to go off-the-grid and live in a cave, gathering nucli and using some of the products in the Earth, but surely you can imagine that it might be, or at least that someone could think it is. And I think it’s similarly conducive — in this very small way: perhaps only has the possibility of contributing — to those things. Even are more direct. Personally, I think it’s wrong that I get to sit at a table and gaily devour while someone is person slaves over a stove. Every time I order food, I make them do more carrying and slaving. Perhaps I prefer it if I just gave them the money. Again you may not think this wrong but I hope you can admit the cave I thought was safe. But then I read Peter Singer’s latest book. He points out that as little as a qua you can buy the oral rehydration salts that will save a child from fatal diarrhea. Perhaps I was killing people the reasons described above. (Although maybe it’s worth helping fund the bombing of children in Afghanistan Mozambique.) But instead of living in a cave, I could go to Africa and volunteer my time. Of course, if I’m doing. How can I decide which action I take will save the most lives? Even if I take the time to figuring out saving lives, it seems impossible to be moral. Not only does everything I do cause great harm, but does morality assume that it’s difficult, but attainable; don’t lie, don’t cheat, don’t steal. But it seems like living is unattainable, surely I should simply do the best I can. (ought implies can, after all.) Peter Singer is a good the good I do for the world. But even this seems like an incredibly generous standard. I should not just stop should: just stop buying factory-farmed food, I should stop buying altogether. I should take things out of searching, I should live somewhere where others won’t be disturbed. Of course all of this worrying and stress world. I can hardly take a step without thinking about who it hurts. So I decide not to worry about the bad screw the rules. But this doesn’t just apply to the rules inspired by Peter Singer. Waiting in line at the check work (and paying will cost me life-saving money) — better just to shoplift. Lying, cheating, any crime can be quest to do good I’ve justified doing all sorts of bad. Nobody questioned me when I went out and ordered to recalls. Is there sense in following their rules or are they just another example of the world’s pervasive in question?