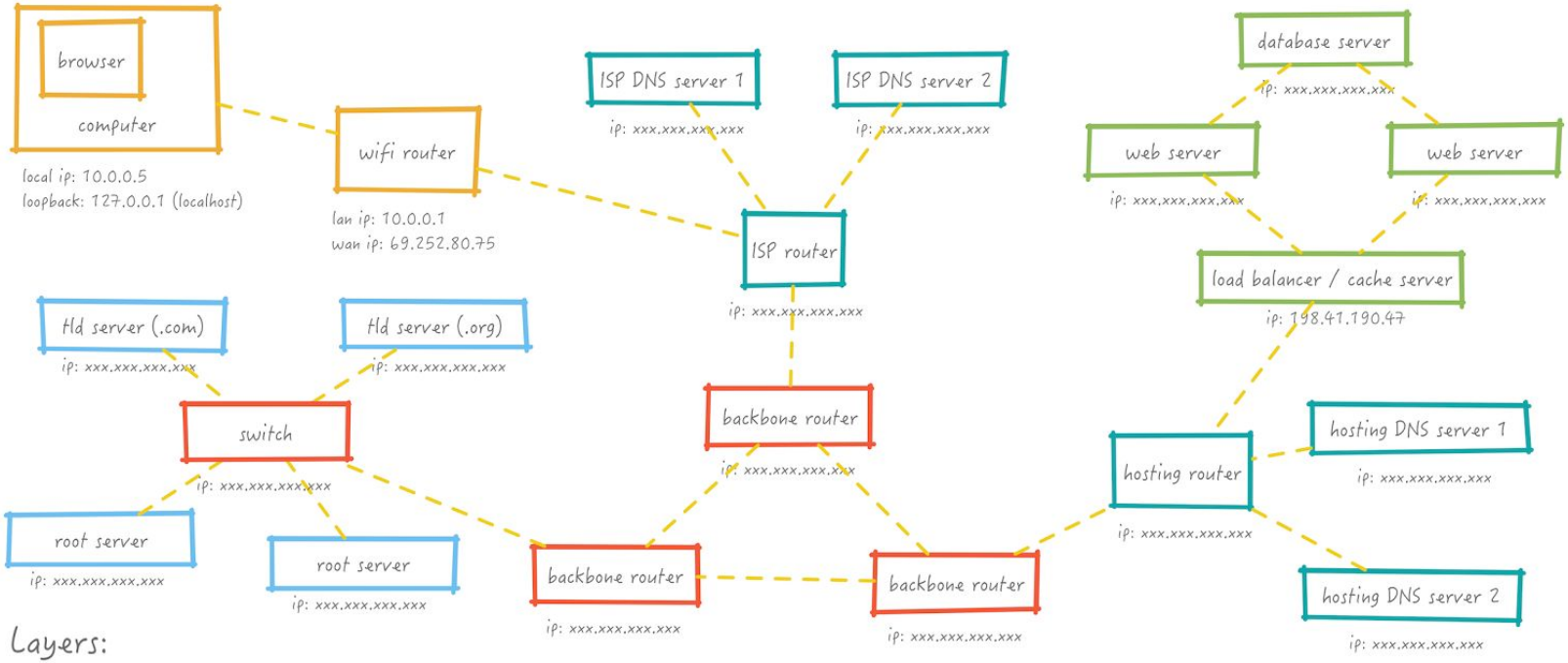
Interwebs Cheat Sheet*



Layers:

- Application
- Transport
- Network
- Link

Protocols:

- DNS
- IP
- HTTP

*dramatically simplified to focus mostly on http

I am a PACKET

I know:

- IP Address that I want to get **to**
- IP Address that I am coming **from**

I can:

- Carry some DATA!
    1. From SOURCE
    2. Go to nearest ROUTER
    3. Router indicates where to go based on my desired DESTINATION
    4. Proceed to next router till DESTINATION
    5. Deliver DATA

Simulation Caveats:

In the real world I exist for very short periods of time, since new humans take inordinately long amounts of time to generate I will run around acting like new packets.

I am a WEB BROWSER

I know:

- URL I want to contact

I can:

1. Ask my computer for DNS resolution
2. Contact IP addresses over HTTP (send HTTP PACKETS)
3. Convert returned HTML into pretty pixels to display for the user

I am a PC

I know:

- My IP address
- My ISP DNS SERVER IP Address

I can:

- Resolve DNS addresses through an iterative process
    1. Ask ISP DNS SERVER
    2. Ask ROOT DNS SERVER
    3. Ask TLD DNS SERVER
    4. Finally ask HOST (authoritative) DNS SERVER

- Run the browser and other stuff!

I am an ISP DNS SERVER

I know:

- My IP Address
- After someone looks up an IP I can cache the result and know it for a while
- ROOT DNS SERVERS IP Address

I can:

- Respond to a DNS query.
    - If I know the answer I give them IP address (cached)
    - If I don't, I tell them to ask ROOT DNS SERVER

I am a ROOT DNS SERVER

I know:

- My IP Address
- IP Addresses of TLD DNS SERVERS

I can:

- Respond to a DNS query.
    - If I know the answer I give them IP address (cached)
    - If I don’t, I tell them to ask TLD DNS SERVER

I am a TLD DNS SERVER

(TLD is Top Level Domain, ie .COM, .ORG, .IO etc)

I know:

- My IP Address
- IP Addresses of HOST (authoritative) DNS SERVERS for my subdomains

I can:

- Respond to a DNS query.
    - If I know the answer I give them IP address (cached)
    - If I don't, I tell them to ask the specific HOST(authoritative) DNS SERVERS

I am a HOST(authoritative) DNS SERVER

I know:

- My IP Address
- IP Addresses of domains registered with me

I can:

- Respond to a DNS query.
    - If the domain is registered with me, I am authoritative! I respond with the exact IP address they are looking for!
    - Otherwise, I tell them I have no idea.

I am a LOAD BALANCER

I know:

- My IP Address
- IP Addresses of several WEB SERVERS
- Load / balancing rules for sending traffic to my WEB SERVERS

I can:

- Forward packets to my choice of WEB SERVERS
    - Based on how busy they seem
    - Or how I feel like.

I am a WEB SERVER

I know:

- My IP Address
- How to construct HTML
- IP address of DATABASE SERVER
- How to ask DATABASE SERVER for things

I can:

1. Receive HTTP GET/POST requests
2. Construct HTML responses
    a. Ask DATABASE SERVER for lists of things
    b. Make some HTML based on DATABASE SERVER response
3. Send back HTML to WEB BROWSER

I am a DATABASE SERVER

I know:

- My IP Address
- Some data about stuff

I can:

1. Respond to SQL queries with data results

I am a ROUTER

I know:

- My IP Address
- Who my neighbor ROUTERS and SERVERS are
- Which of my neighbor ROUTERS to send PACKETS to

I can:

- Tell my neighbors
- Direct PACKETS along:
    - either to the DESTINATION
    - Or to a ROUTER that might be closer to DESTINATION than I am