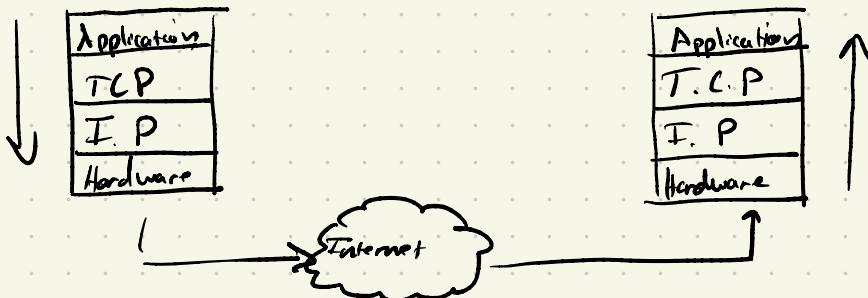


How does the computer talk to the Web?

The Protocol Stack

- Application: specific to web (Http, email, FTP)
- Transmission Control protocol: directs packets to specific apps (port #'s)
- Internet Protocol: Directs packets to a specific computer's address
- Hardware layer: converts binary packet data to network signals and back



What is the Infrastructure of the Web?

- Backbone = large networks connected to each other known as Network Service Providers (NSPs)
- NSPs peer with each other to exchange data
 - data is routed up and down the hierarchy to be delivered (I.P routing)
- DNS is structured similarly to the I.P routing hierarchy

What Happens When You Type an address in?

1. Domain name resolution: the browser connects to a DNS server and retrieves the IP.
2. Browser connects to web server and sends a HTTP request for web page (protocol stack)
3. Web server receives and processes the request
4. Browser receives response and closes the connection
5. Browser parses/ processes the page, doing lookups for other elements to render results
6. HTTP requests resources
- >> Page loads

The Transmission Control Protocol

- Under the application layer is the TCP layer. TCP is responsible for routing app protocols to the correct app on the destination, using ports.
 - a) When TCP layer receives the application data from above, it segments the data into chunks, and adds a TCP header containing port # of destination.
 - b) When TCP layer receives a packet from the layer below, it strips the TCP header, does some data manipulation (if necessary), and sends the data to the correct app.
- TCP is connection oriented, reliable, byte stream service.

The Internet Protocol

- Unlike TCP, IP is an unreliable, connectionless protocol. It is only concerned about sending and routing data.

[IP header | TCP header | Data]

HTTP Flow

- When a client wants to communicate w/ a web server, it performs:
 - a) Open a TCP connection. This is used to send one or more requests, and receive an answer.
 - b) Send a HTTP message. Before HTTP 1.1, these were human readable i.e.

GET / HTTP/1.1
Host: developer.mozilla.org
Accept: ...
3). Read the response

- APIs exist to leverage HTTP. These include XMLHttpRequest, fetch, Server-sent events, etc.