CPSC 216 - IP Addresses, Domain Names, and URL's

There are some things that we should know about the lower layers of the Internet Protocol Suite.

1. IP Addresses.
   → for the foreseeable future, addressing on the internet follows the IPv4 standard

198.51.100.7
0-255 0-255 0-255 0-255

↳ 8 bits in binary.

00000000 → 11111111
0 → 255

# of addresses = 256 × 256 × 256 × 256
= 2^{32}
≈ 4 billion distinct addresses.

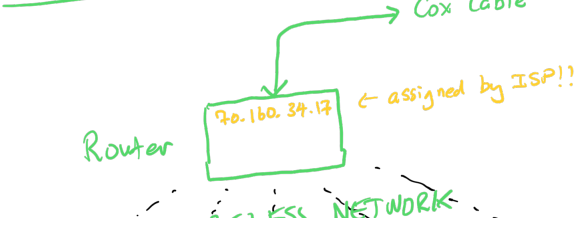
→ 4 billion is less than the total # of computers on the internet, probably !!

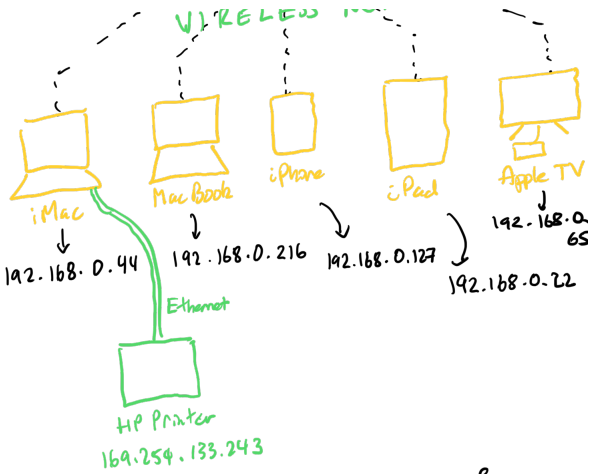
→ Some years ago, there was a movement to move to IPv6 ... 2^{128} distinct addresses... but, nobody knows how to effectively switch to this without breaking the internet ... and the world.

→ Solution has been to put most computers on private networks behind the firewall of organizations and ISP's.

Check out whatsmyip.org to find out what your computer's IP "appears" to be to the outside world.

My Home Network





The Router does a LOT of heavy lifting to correctly route packets of information to the correct place!!!

Domain Names

→ Quite simply, a domain name is a name for an IP address.

jlabdaq.pcs.cnu.edu
= 137.155.2.201

One really important component of the internet are domain name servers or DNS servers, which provide the IP address associated with each domain name.

jlabdaq.pcs.cnu.edu

- jlabdaq: 3rd and 4th level domains (within that organization)
- pcs: 2nd level domain (organization name)
- cnu.edu: top level domain (.com, .net, .edu, .uk, .ca, ...)

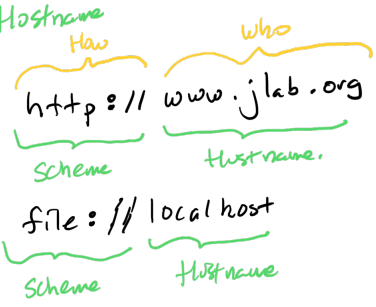
URL's - Uniform Resource Locator

→ standard for specifying the location of any retrievable item on the web ... webpage, file, image, video, ...

A URL consists of TWO required parts:

1. Scheme
2. Hostname

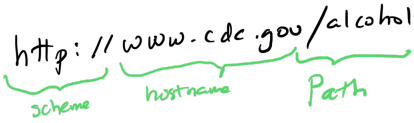
e.g.

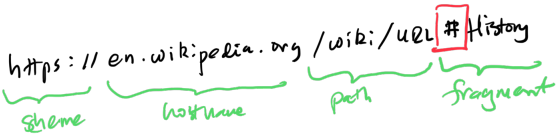


In addition, there can be three additional fields, in the case of web URL's:

3. Path ← specifies a path within the server file system
4. Query String ← extra request data for the web server
5. Fragment ← specifies a location within the webpage.

Ex.





Sidenote: If one does not specify a specific html file in the URL, the web server will choose a default one for you.

Typically, it is called index.html

e.g. https://cnu.edu

= https://cnu.edu/index.html

default path