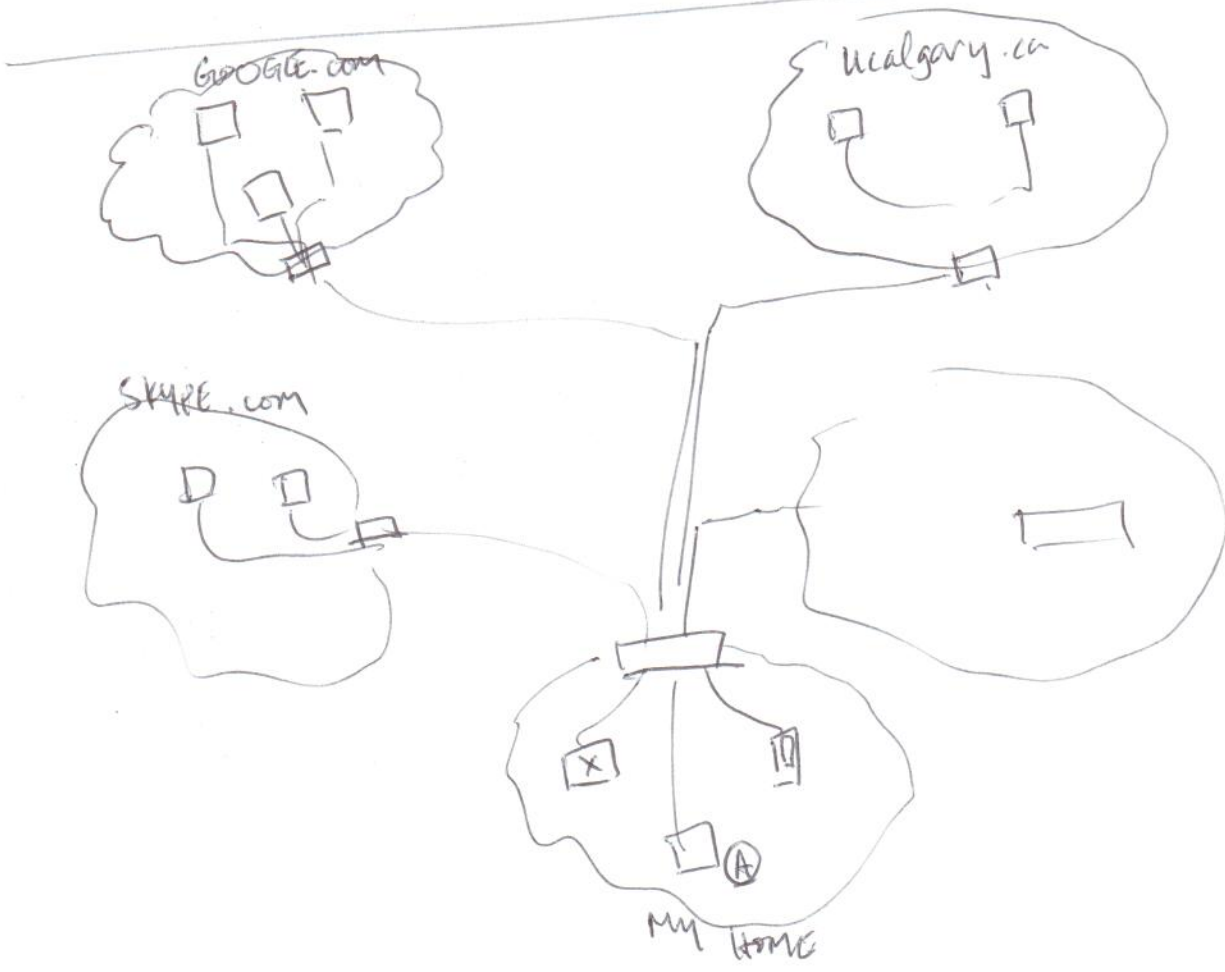


What is a network?

- for our purposes, the Internet. → we are application programmers.

Application	HTTP, FTP, SMTP
Presentation	OSI 7 layer model.
Session	
Transport	TCP
Network	IP
Data Link	ARP RARP
Physical	Ethernet

- TCP/IP is the language of internet.
- we will work on top of it



SKYPE.

- ↳ connect from (A) to (B).
- ↳ send messages to (C) @ school.
- ↳ goes through (B)
- ↳ receive messages from (C)
- ↳ again through (B)

TERMINOLOGY

- PROTOCOLS: rules that facilitate information exchange among programs on network.
 - (“over” or “over”)
 - certain messages, knows format
 - you need to know this to use the program

- SERVER: long-lived program that waits for connections to do something useful.

- WEB
- MAIL
- FILE
- IM.

- CLIENT: program that connects to server to use whatever service it provides

- Browser
- Mail client
- IM client.

↳ most servers can accept connections from multiple clients simultaneously

Internet Addressing.

every machine on internet has an address
sequences of 4 bytes

dotted quad: 192.168.13.40 13.2.117.14.

address identify a machine on the internet.

one special address:

127.0.0.1
local host

WHERE DO THEY COME FROM?

* you can't set it to random & have it work
~~not~~ randomly

- internet: no idea how to see you
- must be compatible to network you're on.

> usually: DHCP dynamic host configuration protocol

- assigns you an IP when you wake / boot a device

- e.g. uc-air @ j of C.

- IP ~~may~~ will change from time to time:
not always there!

with care?

① don't change your IP manually

② DHCP: don't count on having that IP forever

③ If using client & server on same machine, use "localhost"

→ no hard code

How to GET

WINDOWS: START > CMD > IP CONFIG.EXE

MAC: ~~ifconfig~~ TERMINAL > IP CONFIG

LINUX: /S BIN/ IP CONFIG

PUBLIC VS. PRIVATE ADDRESSES

- not all IPs are reachable from every machine:

① ↔ ② can't "see" each other.

with: simple
① often: behind a fire wall

② complex: some IPs are private "non-routable"

10.0.0.0 - 10.255...

172.16.0.0 - 172.31.255...

192.168.0.1 - 192.168.255...

WHY PRIVATE?

* IP conservation

- public addresses uniquely identify a given machine

- private can be re-used (on multi networks)

→ 192.168.0.1 millions

- ~~not~~ certain network configs let you share a single IP through network address translation

- built into most home routers.

* show ~~to~~ 70.72.32.108.

translate

invisible to outside world

WAY CARE?

(6)

- servers \rightarrow private IP not reachable from outside.

C S same

C S saw machine

S @ school C @ home

ADMIN

64.223.161.104

google.com

DNS

distributed database

name \rightarrow IP.

PORTS

multiple servers same host?

web mail FTP.

how to know?

PORTS.

0-65535

- Some well known

80 HTTP

21 FTP

~~22~~
SSH

FTP runs on port 21.

clients spec a ^{dst} port to ~~connect to~~ connect to,
assigned a src port.

- only one client / service on port at any time