16.10.23 12:00

CSCI 101
Connecting with Computer Science
Lecture 2: Introduction to WWW I

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2023 Fall Semester (S3)

Overview

- Focus: Internet
- Architecture: von Neumann
- Readings: 1
- Core Ideas:
    1. History
    2. Constructions/Infrastructures
    3. Things to Think about

History of the Internet

Summary

1. https://www.youtube.com/watch?v=9hIQjrMHTv4

History

- 1969 ARPANET
  - University of Utah with three research centres in California
  - A prototype to test the concept of **packet switching**

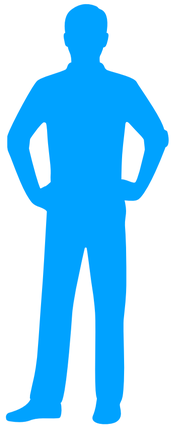
The ARPANET in December 1969

Concept

P1
History

Packet Switching

A



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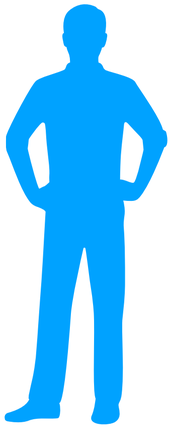


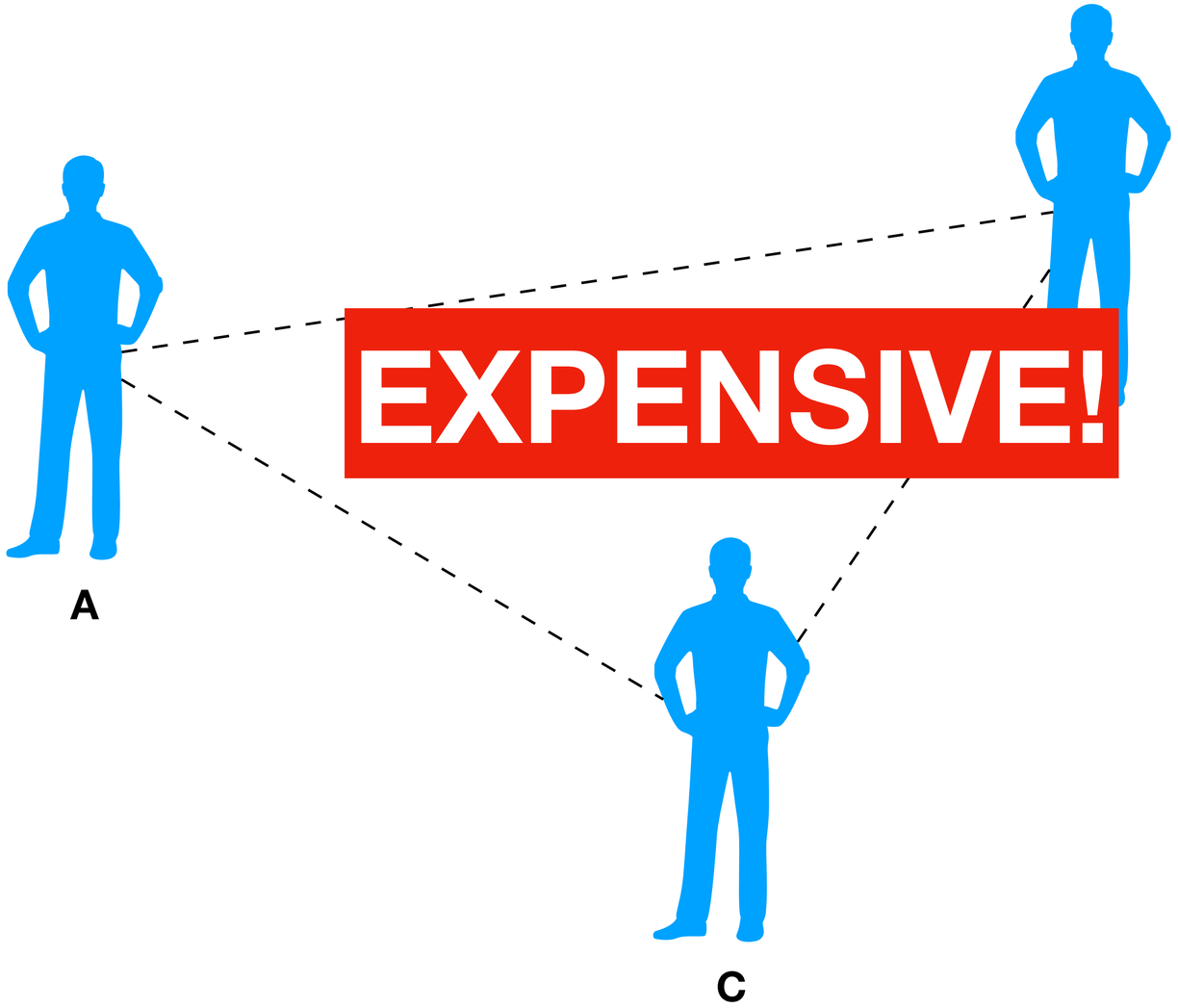
C

Example

P1
History

Packet Switching

Connections between each pair of people

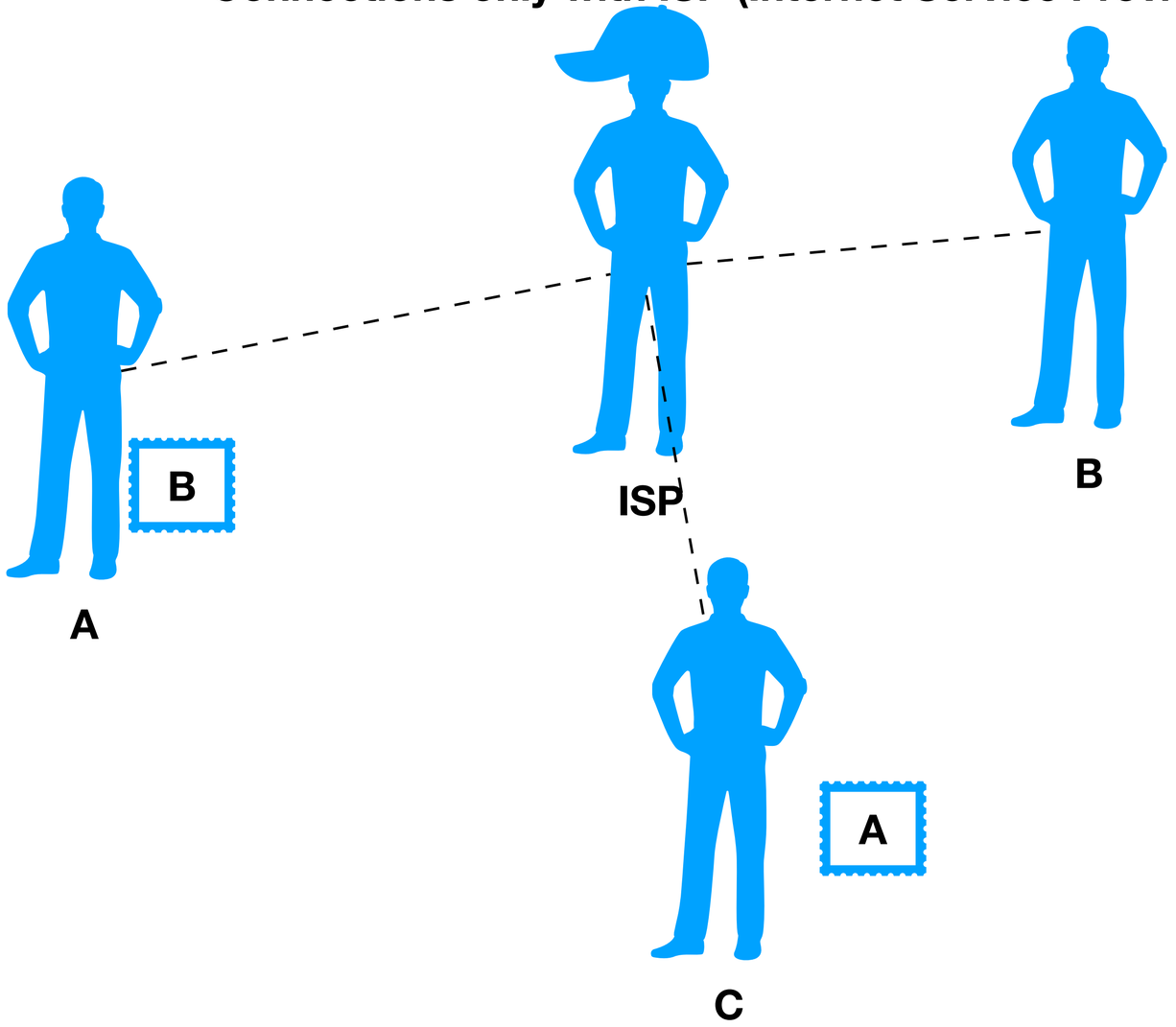


Example

P1
History

Packet Switching

Connections only with ISP (Internet Service Provider)

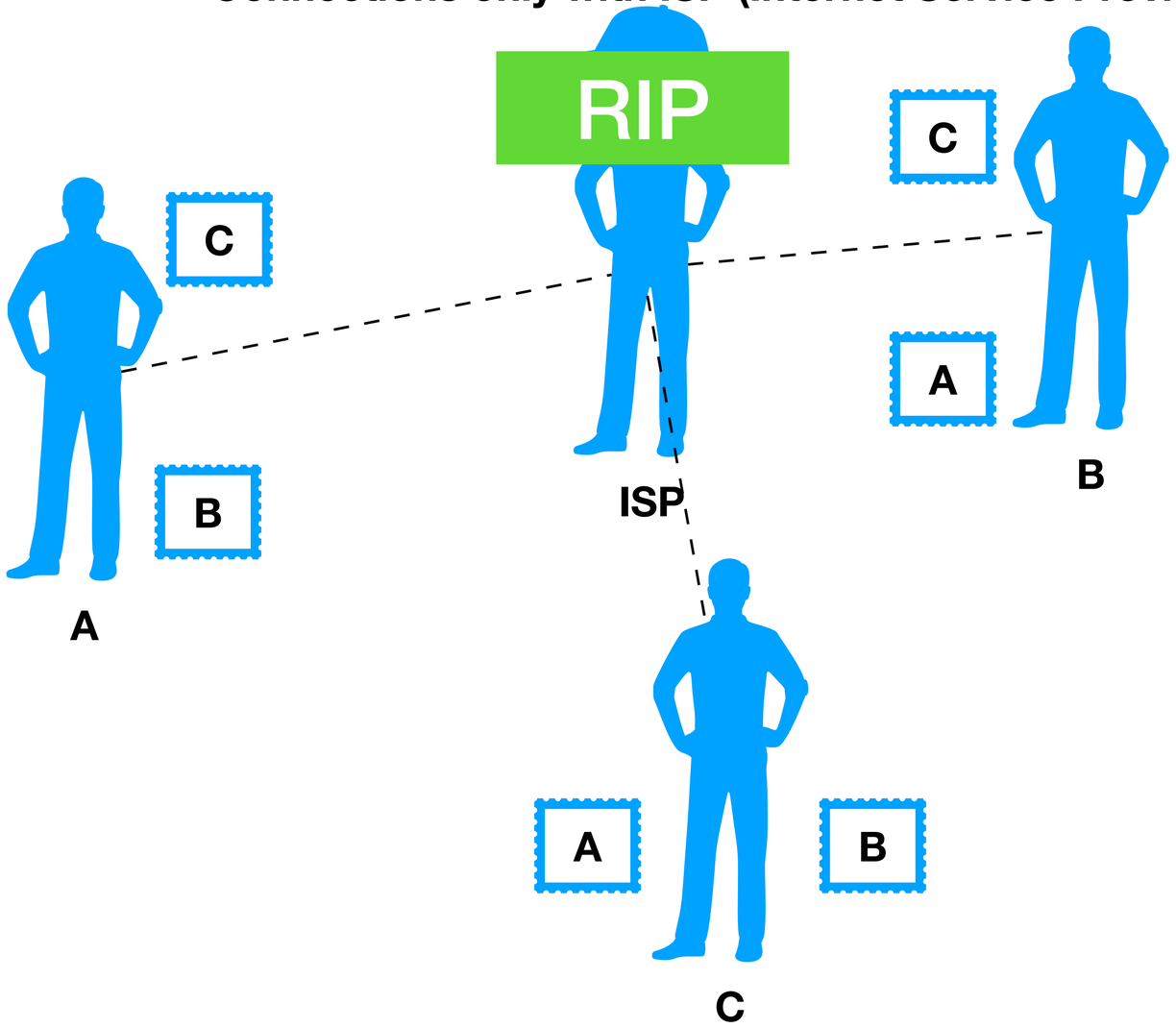


Example

P1
History

Packet Switching

Connections only with ISP (Internet Service Provider)



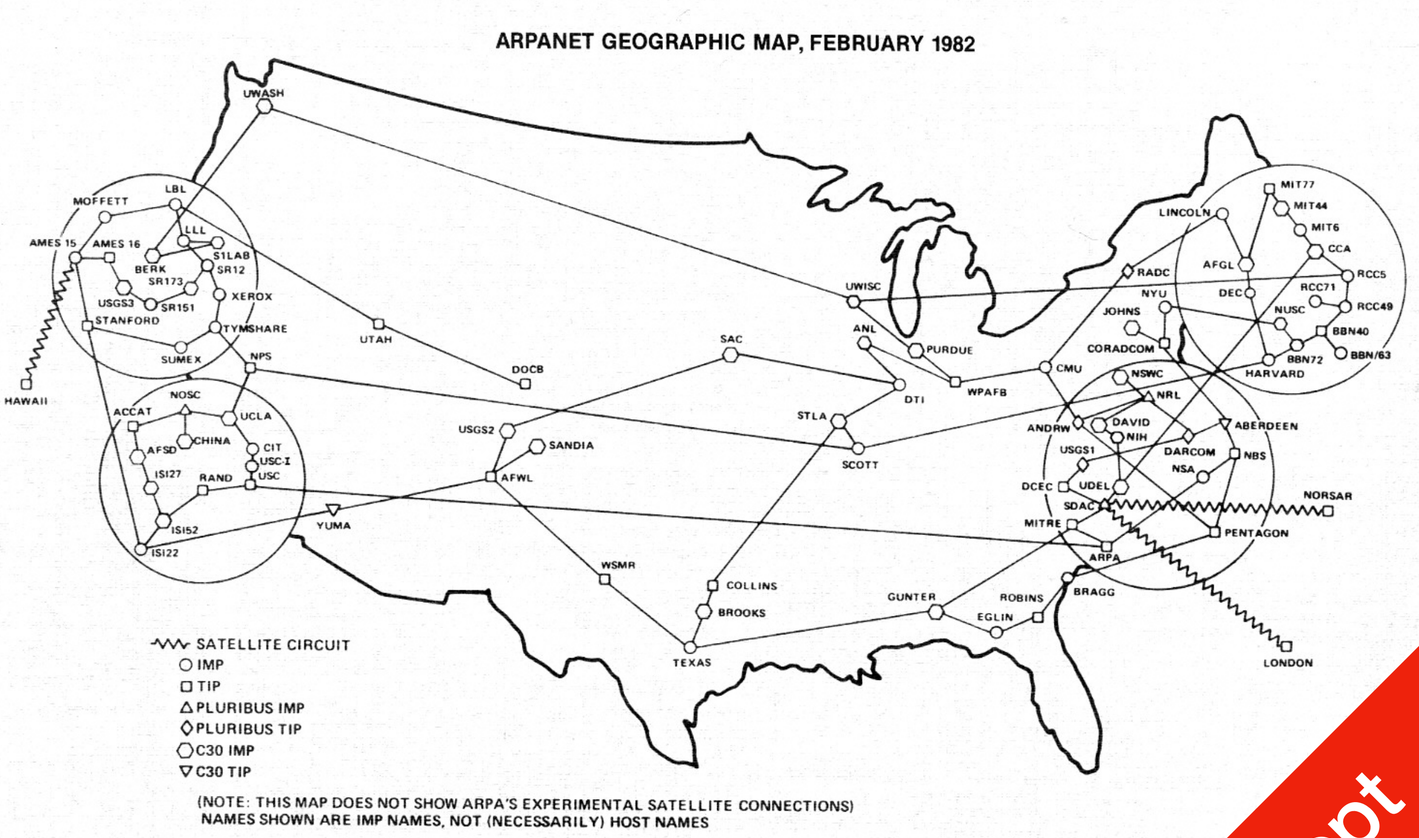
Packet: data, information

Packet switching:
Too many packets arrive at the same time, how to handle it?

Example

History

- 1969 ARPANET
  - University of Utah with three research centres in California
  - A prototype to test the concep **packet switching**
- **1982: international**
- **1994: privatisation of internet**



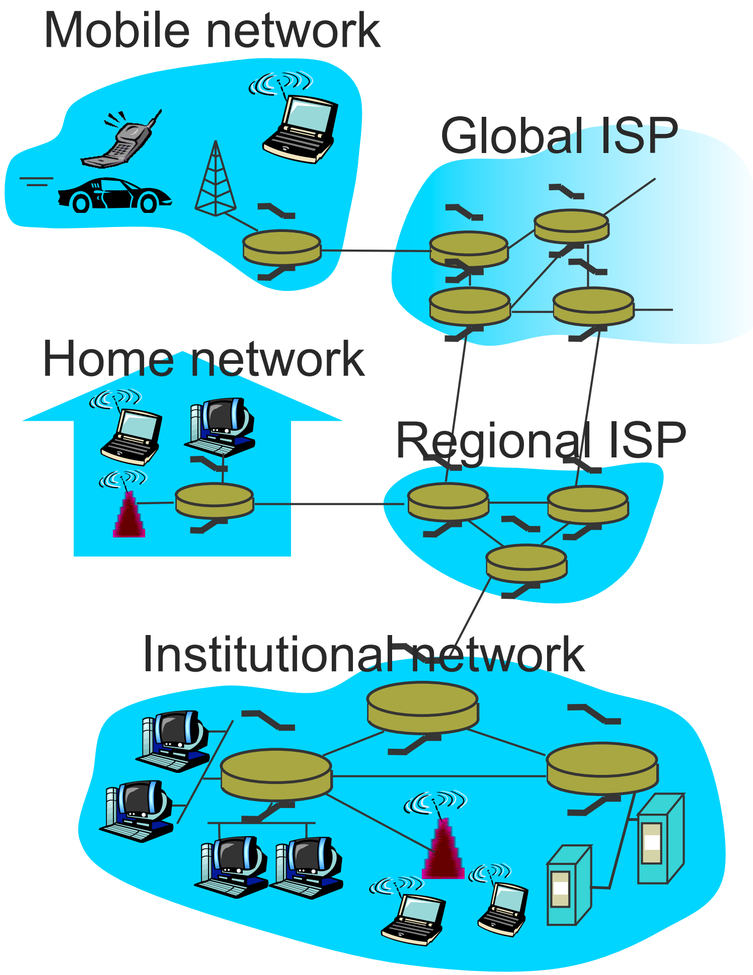
Concept

Constructions/ Infrastructures

Summary

Communication Infrastructure

- ISP: Internet Service Provider
  - Provide connections to end-users and access to sub-networks
  - Mobile network
    - 3G, 4G LTE, 5G, satlink, etc.



Concept

Essence: Delivery Business

- The essence of internet is **Packet Delivery**
  - Transfer data between end systems
  - Each packet is a fixed size data block
  - Packet delivery services depends on the protocol
    - Best effort (ASAP but unreliable, most common)
    - Reliable data delivery: reserved for critical services

Concept

P2
Structure

Network Architecture

- Very very very complicated, so complicated that I can promise you you cannot remember after I tell you
- So I am not gonna tell you (a lot)

Concept

Multiple layers of hardware and software

- Physical (e.g. cable, RJ45)
- Data Link (e.g. MAC, switches)
- Network (e.g. IP, routers)
- Transport (e.g. TCP, UDP, port numbers)
- Session (e.g. Syn/Ack)
- Presentation (e.g. encryption, ASCII, PNG, MIDI)
- Application (e.g. SNMP, HTTP, FTP)

Concept

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You are agnostic

Concept

P2
Structure

Brilliance

- What make the internet such an amazing technology?
  - Your average user don’t know how complicated it is
  - Most professional IT people don’t know how complicated it is

Concept

P3
Evolution

The Evolution of Human Race in Age of Internet

Summary

P3
Evolution

What makes the Internet Different?

- We know the internet is all about delivering information
- What makes it different from the other technology?

Concept

P3
Evolution

Important Technologies

- Letters

  + Distant communications, through text

- Telegram

  + Fast communications, through text (but not instant)

- Telephone

  + Acoustics, instantaneous

Concept

Important Technologies

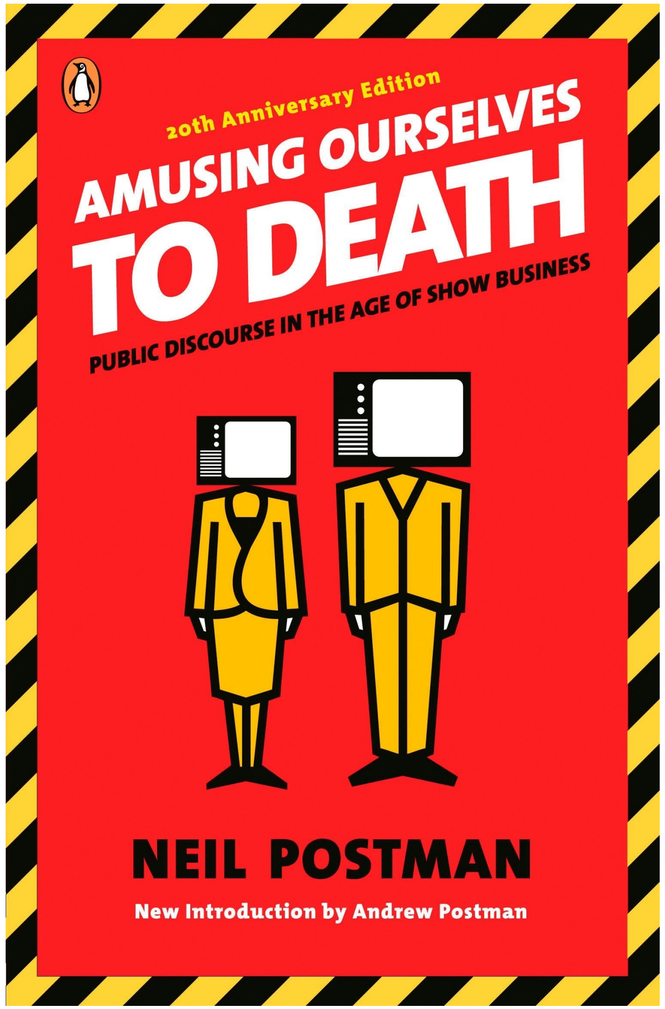
- Televisions

  + Video, Age of brand new medium

- Videoconferencing

  + Instantaneous video

  + Virtual presence



Concept

What makes the Internet so revolutionary?

P3
Evolution

What makes the Internet so revolutionary?

- Automation
- Detachment
- Untraceable

Concept

P3
Evolution

Automation

- Service Automation
- Medium Automation

Concept

P3
Evolution

Automation

- Manufacturing cost for fashion brands like Zara is 5% of their retail prices
  - Most spendings are online advertisement
- 90% of sales for a small Café in central China comes from online delivery order
- Cost of a single ad by an influencer in China: (ByteDance, up to 50K CAD)
- Online job seekers: 100 resumes a day, for a barista position on E Hasting st
  - Eventually, the owner hired two people how came physically to the shop and dropped off resume

Think

1. Various sources

P3
Evolution

Automation

- Media consumption

  - How many hours do you spend on social media?
  - Have you tried blogging / vlogging?
  - When is the last time you went for something NOT given by an automated recommendation system?
  - Why do you go to the theatre instead of Netflix?
  - When is the last time you picked up a book and read? (including eBooks)

Think

P3
Evolution

Detachment

- Are instant messages really instant?
- Polarised public opinions
  Is internet encouraging free speech or censoring it?
- Service detachment
  "Inhumane" automation of services

Concept

P3
Evolution

Detachment

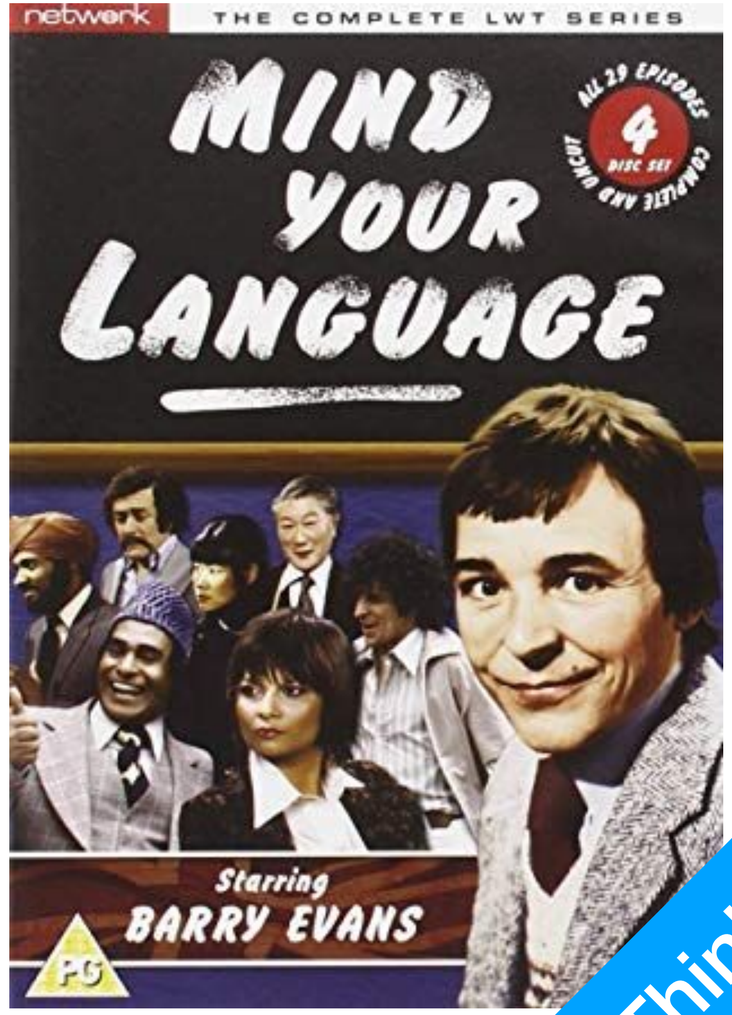
- Have you gone out a day without internet?
- How frequent do you check your phone?
- When’s the last time you ate with friends WITHOUT ever checking your smartphone?
- Have you ever broken up with someone over SMS/Social Media?
- Have you ever had "read but no reply"?
- How often do conversations start/end with memes?

Think

P3
Evolution

Detachment

- Do you make your own choices?
- Do you really make your own choices?
  Think about the bad things you've heard about Trump and Joe Biden. Are those sources really reliable?
- What do you think about Political Correctness?
- What do you think about the Sino-Indian conflicts in recent days?



Think

1. Watch Mind Your Language on youtube, do you think this show would have been made in 2020?

P3
Evolution

Detachment

- Have you tried Fido’s customer service?
- What do you think about online counselling?
- Ever heard of Salesforce?
- What do you think about online education?

Think

P3
Evolution

Untraceable

- Blockchain and Cryptocurrencies
- Cyberbullying and Privacy
- Darknet

Concept

P3
Evolution

The Evolution of Human Race in Age of Internet

- What has the internet changed?
  - The way we live
    - interact with family and friends, entertain, eat, and travel
  - The way we work
    - Online businesses
    - Intelligent business systems
  - The way we die

Concept

P3
Evolution

The Evolution of Human Race in Age of Internet

- Internet is a tool.
- DO NOT BE USED BY A TOOL.

Concept