

# Net neutrality

IERG5090

# Communications as a regulated industry

- Since the days of telegram and telephone services, communication services are regulated to provide a “neutral” service
- Telephone service known as “common carriers”, under US law.
- Regulation agency in the US: Federal Communications Commission (FCC)
- These communications services were mostly monopolies, e.g. telephone service in US

- For details, check [https://en.wikipedia.org/wiki/Net\\_neutrality\\_in\\_the\\_United\\_States](https://en.wikipedia.org/wiki/Net_neutrality_in_the_United_States)

Questions:

- What about Internet, should it be regulated by law to provide a neutral service?
- Since Internet is global, what can be regulated? Who can regulate?
- What are the arguments for and against regulation?

# Some example of offending practices

## The Madison River case:

- It is a local telephone carrier
- It also provides Internet access service, via ADSL lines
- In early 2005, it started to block voice-over-IP service used by its Internet users
- FCC looked into it
- It was resolved in a settlement: Madison River paid \$15K to US, and promised to stop the practice; FCC dropped the case

## The Comcast case:

- Comcast was the largest Cable TV provider in US
- It also provides Internet access service, via its cable modems
- In 2007, it was found to block, or throttle, BitTorrent traffic, a P2P application for content sharing
- In 2008, FCC filed formal complaint against Comcast: cease-and-desist
- In 2009, Comcast proposed to settle the case (for \$16M) but without admitting wrong-doing

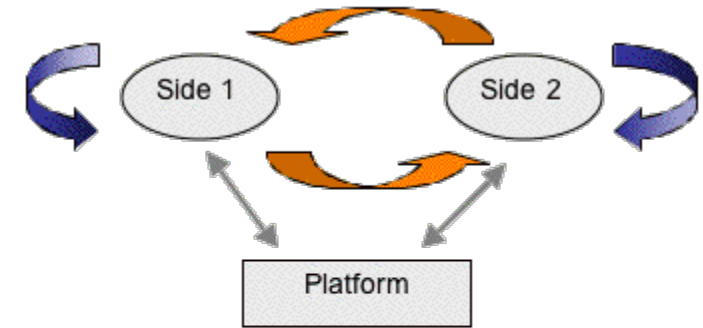
# Regulated monopoly

- In US, telephone service was traditionally a monopoly service, i.e. AT&T
- In 1984, AT&T was split up; AT&T for long distance, Lucent for equipment, 7 “Baby bells” were still monopoly in local markets
- Similarly, Cable TV is also a monopoly business in many markets
- Net neutrality, is partly motivated by the anti-competition practices
- Note, while phone companies provide communication services, cable companies supposedly provide “information services”, under different regulation rules

# A theory of the advantages of competition

## – two sided markets

- A platform has two sides: service providers and users, affecting each other:
  - The more users attract more service providers
  - The more service providers attract more users
- Examples of platforms, e.g.:
  - Credit card (Visa, MC, AE...)
  - HMO (doctors and patients)
  - Internet is also a platform
- The value of Internet is enhanced when it is open to all service providers to compete



[https://en.wikipedia.org/wiki/Two-sided\\_market](https://en.wikipedia.org/wiki/Two-sided_market)

[http://www.stern.nyu.edu/networks/Economides\\_Tag\\_Net\\_Neutrality.pdf](http://www.stern.nyu.edu/networks/Economides_Tag_Net_Neutrality.pdf)

# Support for net neutrality

- The idea of net neutrality got support from not only new content/service providers, but
  - Civil liberty groups, arguing for freedom of speech
  - Internet/Web pioneers (such as Vint Cerf, Tim B-Lee), arguing Internet should be open
  - Various user groups, and NGOs
- These supporters pushed net neutrality towards a more strict form:
  - No QoS, all packets treated the same
  - No tiered pricing
  - No filtering of any traffic
- Essentially, Internet should be regulated like the telecom service

# Opponents of net neutrality

- AT&T and Comcast, and ISPs in general, are known to be the biggest opponents
- Besides, other opponents include:
  - Economists, financial people who believe in free market
  - Many manufacturers to supply to Internet infrastructure: IBM, Cisco, Intel, Juniper, Qualcomm, etc.
  - Some engineers, researchers working with Internet technology, e.g. Bob Kahn
- Main arguments:
  - It creates disincentive for ISPs to invest in infrastructure, and BW
  - Internet is different than Telecom, there are different services which require different treatment
  - Such regulation invites more government control

# New practices attracting debate: Fast lanes and sponsored data

- Fast Lanes:
  - Content providers such as YouTube, Netflix or Spotify want their customers get better service, to stay with their content
  - If so, they can use their “eyeballs” to generate advertisement income
  - These content providers are willing to pay access providers for better service
  - Or they “sponsor” data to their sites, so traffic is not counted in user’s quota
- This is a way for ISPs to get something back from OTT content providers
- This may serve as incentive for ISPs to invest for more bandwidth
- There are start-ups working on this <https://www.wired.com/2016/09/build-internet-fast-lanes/>



# New practices attracting debate: zero-rate service

- Zero-rate service:
  - Some content providers are willing to help users get connected to the internet for free, but limit their internet access to those providing such free service
  - E.g. Facebook is a well-known supporter of such movement
- Zero-rating services were introduced in various under-developed, or developing countries
- In some countries, it met with resistance, or was forbidden by governments, e.g. Chile, and India

<http://www.fiercewireless.com/wireless/net-neutrality-advocates-target-zero-rated-offerings-from-verizon-t-mobile-others>

# Timeline of FCC regulation actions

- Serious discuss of the issue started around 2005-2006, after the conflicts between ISPs and CSPs surfaced
- In 2008, FCC ordered ISPs to stop their practices; ISPs sued FCC
- In early 2010, Court ruled FCC does not have authority of its order
- In late 2010, FCC issued “Open Internet Order”, with several specific clauses
- In 2011, the Court over-ruled some of the clauses, allowing only one clause;
- In 2014, FCC revised their Open Internet Order, to allow fast lanes, but it was met with public complaints
- In 2015, FCC voted to reclassify Internet access service as Telecommunications service, subject to a relaxed version of telecom regulations
- The battle goes on...

# Why does net neutrality concern engineers?

- Net neutrality policy affect Internet protocol design, management and governance
- For example, there was a movement to make all transport protocols “TCP-friendly”, it is a net neutrality issue

# A recent paper

- A recent survey paper gave a very good summary of the issues of net neutrality
- It also gives a summary of how different countries regulate net neutrality
- It was published as a position paper in Sigcomm Computer Communications Review:
  - They argue the problem with Fast lane type of solutions is lack of user, and small CSP involvement.
  - They proposes:
    - a) Allow a user knob to control % used for fast lane
    - b) CSP payment is based on micropayment, rather than lump sum amount, to allow small CSP to also participate

<http://www.sigcomm.org/sites/default/files/ccr/papers/2016/January/0000000-0000008.pdf>

# Summary

- Net neutrality is an issue that affects the design and management of the Internet
- It has technical, economic and social implications
- It is a complicated issues, being debated for more than 10 years
  - Mostly in the US
  - Also in different parts of the world
- What do you think?