

Net Neutrality: Delivering Internet Data



COMP6218

General questions

- What is the point of the Web? Why do we use the Web?
- What value do we expect the Web to provide us?
- What value do we deliver to the Web?
- How is the Web sustainable?

Layers of Internet: Web Inside!

Layers	No.	Components
Content and Transaction (social)	5	Information exchanged and the interactions and behaviours involved
Application (engineering)	4	Utility protocols: FTP, HTTP , SMTP. Provides process-to-process data exchange for applications
Transport (engineering)	3	Protocols for data transport like TCP, UDP (chosen according IP packet indication), handling host-to-host communication
Network / Internet (engineering)	2	IP carries packets from a source to destination, using the routing protocols to determine the paths taken by the packets, connecting independent networks, thus establishing internetworking
Physical / hardware link (engineering)	1	Over which packets are carried: ARP, NDP (auto-configuration of nodes: olds and news), MAC (Ethernet, DSL, FDDI), WiFi, satellite links... Containing communication methods for data that remains within a single network segment (link)

The Original Internet World

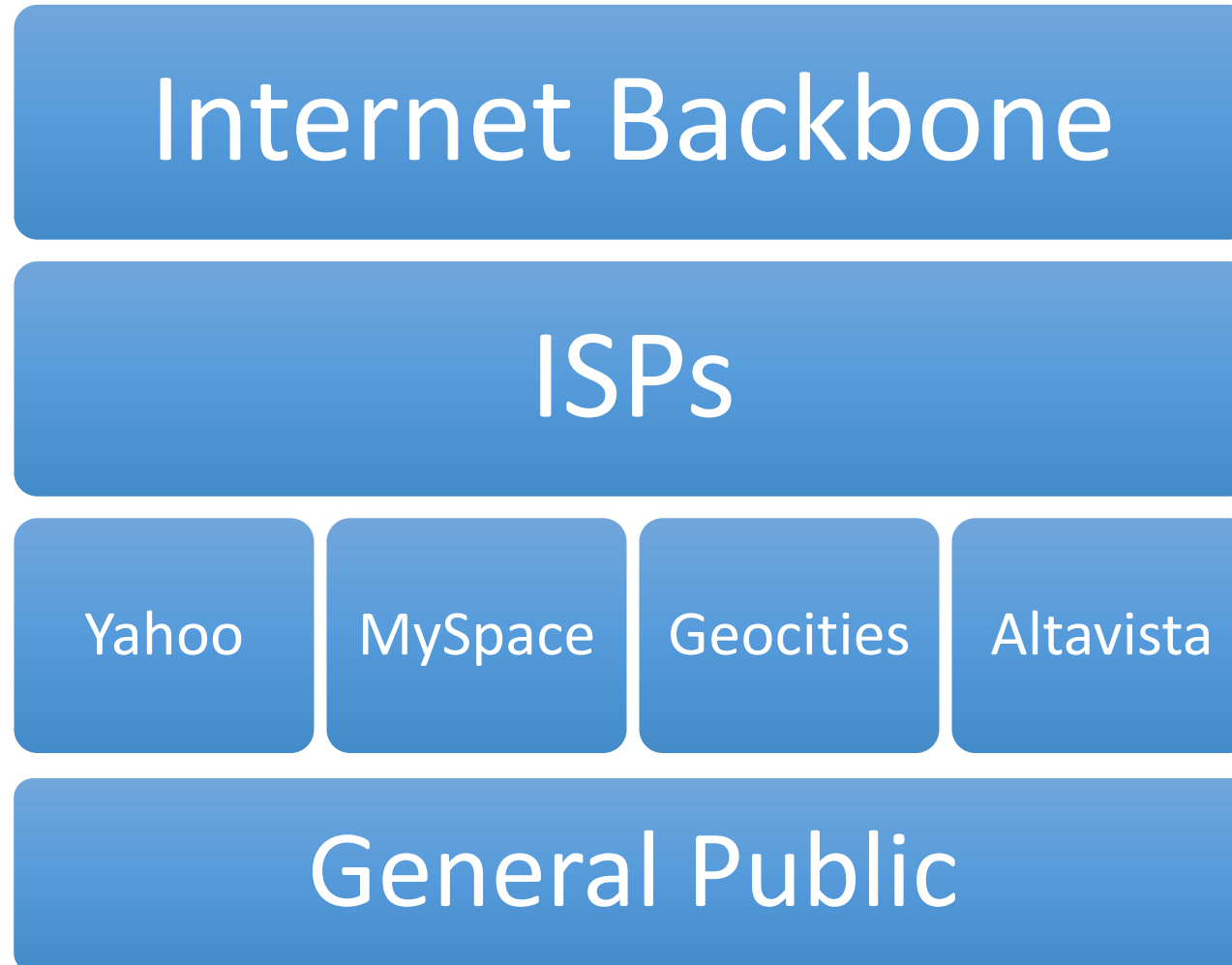
NSFNet

Universities

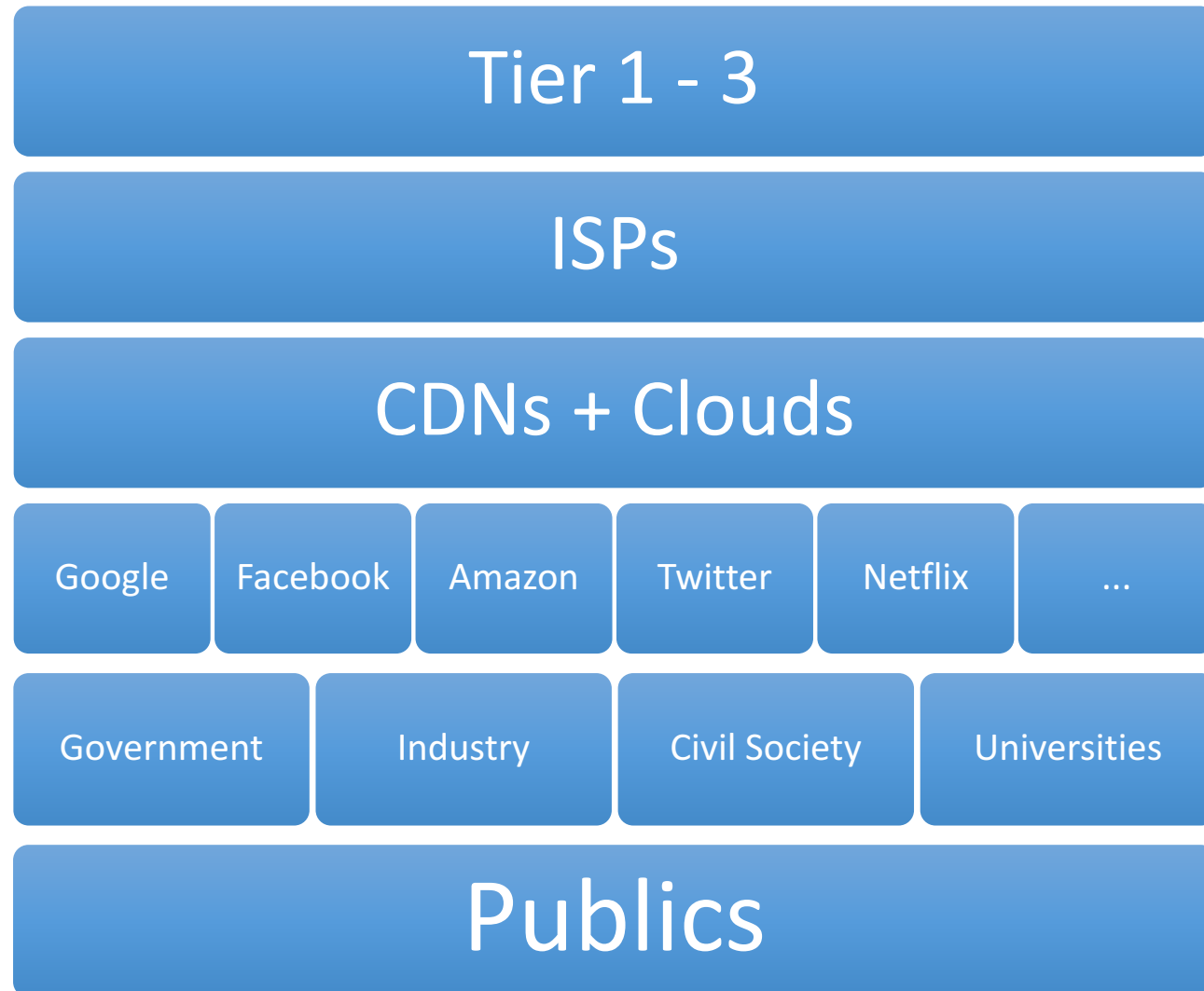
The Original Internet World (2)



The Early Web Ecosystem



Modern Web Ecosystem




Who Pays? What Value?

- **Web 0: NSFNET 1980s**

- Pre- and pre-historic web
- NREN as public good, from govt research funds
- Use restricted to research sector in US (at first)


- **Web 1.0 1990s**

- ISP / telco as subscription access to Internet.
- Web / free at point of use...emergence of monetised products
 - commercial services (EBay, Amazon, Netflix)
 - web advertising

 *Huge increase in accessibility*

- **Web 2.0 2010s**

- Mobile operator as metered / capped access to Internet.
- Monetised surveillance is dominant funding model for Web properties
- Social Web as co-creative space where participants produce data...emergence of a data trading space

Huge increase in accessibility 

Web Participants

- The Web is a *data exchanging* space, we receive data if we deliver data in return.
- Data have different kinds of potential value
- Information has contextual value upon time, space, place and recipient
- The Web participants: people, governments, private companies, communities.
 - Most of them participate through their web sites

Public Goods

- Commons are resources available for public benefit, but individual rivalry may deplete the resource, depriving others of benefit
- Public goods are non-rivalrous commons
- Pure public goods are also non-excludable, that it is impossible to prevent an individual from consuming them
- *Global* public goods represent universal benefits in terms of nations (globally), participants (stakeholders and the public), and generations (present and future).
- Public goods need efficient allocation, otherwise market failure.

The Internet as public good

The Internet is an impure global public good (UNDP, 1999).

- Human-made global commons,
- Subject to non-rival consumption, meaning that additional individuals benefit at zero marginal (production) cost.
- Partly non-excludable... transmission's costs exclude poor individuals to access, or regulations put entry barriers.

The Internet is a club good (World Development Report,2016)

- Excludable
- Non-rivalrous
- Enormous positive externalities

Net Neutrality – Pay to Deliver Premium Services?

 TELCO ADSL Your email. Your world wide web. Your imagination.	\$29.95 Includes 500 MB of free transfers to non-peering websites at full speed. Limited to 128 kbps thereafter.	 +\$10 hollywood \$15 after September	Includes free Hulu subscription. Enjoy exclusive content from your favourite networks.
 +\$5 pathfinder	Includes a massive extra 1000 MB a month to non-peering and non-elected websites. Limited to 256 kbps thereafter.	 +\$0 the social Just \$5 after three months	All social networks. All your friends. Includes all your dating sites.
 +\$5 international	Includes the top 200 services from over 30 countries.	 +\$10 the beat	Listen to your favourite music. Includes three months of emusic.
 +\$5 news	News Freak? Get your fix. Includes free online access to your local news site.	 +\$5 marketplace	Save money. Shop online. All your favourite things, secure and fast. Includes Internet Banking from over 20 financial institutions. Access to services not pictured here may incur additional costs.
 +\$5 playground	Gamer? We hear you. Unwind, relax and play hard.	Recharge +\$5 recharge	Your full-speed quota wasn't enough? A massive 2000 MB for access to your company's VPN at full speed. For accessing your friends' non-peering websites at full speed. For getting your emails faster and the included limit didn't cut it. Or if you're a web designer and need some extra buffer. Whether it be the world wide web, VPN or email, we have you covered.

Net Neutrality – What kind of Web do we want?

- Should Internet Providers be able to influence what kind of material can appear on the Internet?

- Who are the actors?



- How control?

- Block, throttle e.g. media types, or service types.
- Only allow promoted partners.

Regulation

- Chile in 2010
- Netherlands in 2011
- Brazil in 2014,
- Slovenia
- Recently in the US
- And most recently 27th October 2015, the European Commission has adopted the Telecoms Single Market regulation including **Open Internet** guarantees
 - In the open Internet all traffic will be treated equally
 - Subject to public interest exceptions – child porn, cyber security, malware
 - Compromise for fast lane.



FOR – open, distributed network

- The Internet considered a human right?
- The Web – the Internet – is an open, public system that is made up of many privately owned components.
- Those who own the networks and the sites shouldn't be able to control what the internet is used for.
 - Like a water company controlling whether you can wash your hands or have a shower
 - Or a car company Ford forbidding you to put Sainsbury or Walmart's groceries in the boot / trunk.
- Innovation
 - We didn't know in 1980 what the internet would be used for (just email and file transfer!)
 - We can't prejudge what new kinds of data and service will come along
 - Must have an equal access for startups and big companies

FOR – Internet needs protection

- As well as ISPs (BT / AT&T), other Web companies are providing Internet services
 - Facebook's Internet.org - in Africa
 - Google Loon project – balloons in the stratosphere beaming a 4G service
- Will they only offer access to their business partners Websites?
- ISPs should not become gatekeepers of what works well in the Internet and what doesn't.
 - We haven't voted for them
 - They are business oriented
- This can kill competition and innovation, especially startups.

FOR – protection for industry and consumers

- Protection for content provider
 - you won't be subject to the willingness of the ISP to give you a fast or a slow lane to your data.
- Protection for content user
 - why some sites should take more time to load, or even never load, as the product of a decision of your ISP?
- The Web envisioned by TBL is neutral. It is an open platform for collaboration and innovation. The web is what it is now because he designed it for data to be treated equally. #WEBWEWANT

See Also

- NET NEUTRALITY IN EUROPE: A STATEMENT FROM SIR TIM BERNERS-LEE (2015)
A statement by Tim Berners-Lee which was posted on the 26th October 2015, the day before the European Parliament vote
 - <http://webfoundation.org/2015/10/net-neutrality-in-europe-a-statement-from-sir-tim-berners-lee/>
- HOW UK ISPS HAVE A CHOKEHOLD ON OUR INTERNET ACCESS (2014)
An article written by Jay McGregor on the Techradar.com website
 - <http://www.techradar.com/news/internet/uk-isps-a-private-members-club-stifling-progression--1246056>
- WHY WE SHOULD JOIN THE MOVEMENT TO SAVE THE INTERNET IN EUROPE (2015)
An article written on the 26th October 2015 by Professor Barbara Schewick, a law professor in Stanford University, and Larry Lessig which is available on the Backchannel website
 - <https://medium.com/backchannel/why-we-should-join-the-movement-to-save-the-internet-in-europe-larry-lessig-and-barbara-van-189b7206c6ac>

Against – someone has to pay!

- The Internet has already been considered considered a human right...
- The Internet is not free, someone has to pay for it.
- **ORIGINALLY IT WAS ALL PAID BY GOVERNMENT / MILITARY BECAUSE IT WAS SPECIALISED AND SMALL**
- However, not everyone can afford it, and even if they could, there are areas where there is no service, but...

Against – Companies work in the public good

- Great news!: There are moves being made towards granting access to everyone, both at industry and governmental level.
 - **Companies:** Silicon Valley companies not only seek profit They also known for undertaking important social missions that governments cannot afford. The innovative nature of industry can play in benefit for everyone. **Strict net neutrality regulations could be detrimental** to the innovative drive of these companies.
 - Internet.org, by Facebook: providing free (or affordable) connectivity to underserved regions in Africa, Asia and Latinamerica. **Although they are basic services, and chosen by the provider, it is much better than nothing! And it can really change the lives of many people.**
 - Project Loon, by Google: releasing high altitude balloons highly cost effective to create a network of transmitters that can provide connectivity to large areas. **It is Google, they may be after our data, but the service they are providing is invaluable:** connectivity to everyone, TBL's dream come true!
 - **Governments:** We are also witnessing how governments are regulating towards the provision of affordable internet for everyone. For example, last 27th of October the European Commission approved a package of measures that include the end of roaming charges by 2017. They have also allowed ISPs to continue trading with fast Internet lanes, which is a reasonable compromise. That decision is on the interest of everyone, as it incentivates ISPs to provide a better service

AGAINST – Government Interference

- **tight regulation can kill competition.** This competition is what is making ISPs to provide better service at a better price, and it is a nobel price economist Gary Becker, who says that: net neutrality can be detrimental to consumer welfare
- **We cannot treat all data equally.** Video streaming, for example, is highly demanding, and so is illegal P2P sharing. Strict Net neutrality regulations are dangerous because they can overload the lanes with traffic and compromise the circulation of important data.
- Nicholas Negroponte's example: if you have a **pacemaker** sending and receiving data to the cloud, Net neutrality can put your life in danger because an overload of traffic caused by video streamers can slow down the data exchange of your medical device.

See Also

- **NICHOLAS NEGROPONTE: NET NEUTRALITY DOESN'T MAKE SENSE**
 - In this video available on the Big Think web site, MIT Media Lab founder Nicholas Negroponte discusses why he thinks that net neutrality doesn't make sense. You may like to skip to 3:04 minutes for the first mention of net neutrality
 - <http://bigthink.com/videos/bits-bits-everywhere-with-mit-media-labs-nicholas-negroponte>
- **THE UK DOESN'T NEED NET NEUTRALITY REGULATIONS ... YET (2015)**
 - In this article available on The Conversation website, Professor Jon Crowcroft from Cambridge University discusses why net neutrality regulations could be detrimental to the service that ISPs provide in areas where there is fair competition between ISPs such as the UK, Europe, Japan, and South Korea
 - <https://theconversation.com/the-uk-doesnt-need-net-neutrality-regulations-yet-38204>

Make Up Your Own Mind



- But argue **CRITICALLY** about the pros and cons
- Don't blindly accept anyone's propaganda
- Come to a **REASONED** conclusion