

UNIVERSITY OF
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Net Neutrality

COMP3220 Web Infrastructure

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Internet service providers should enable **access to all content and applications** regardless of the source, and **without favouring or blocking** particular products or websites

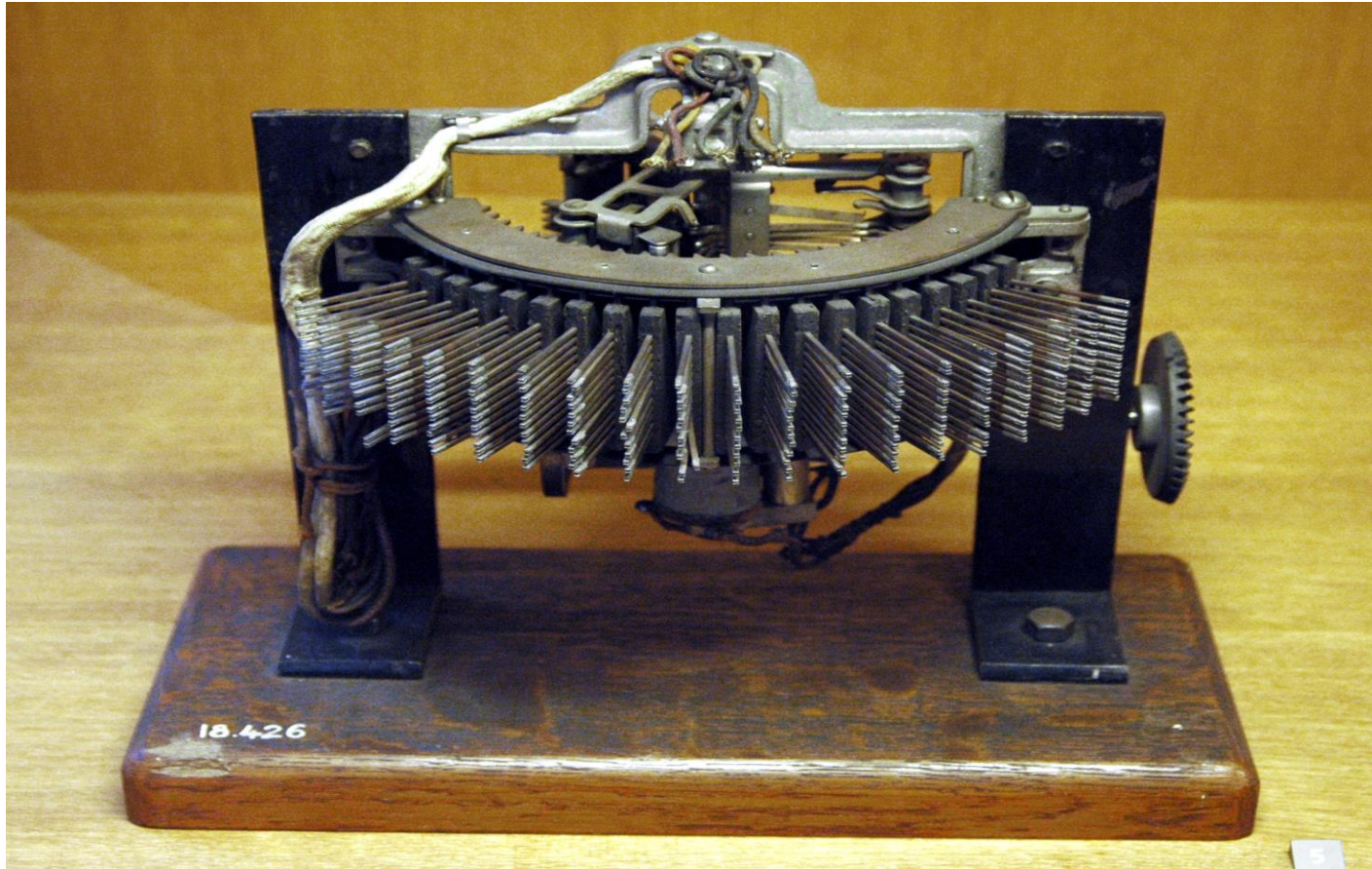
Telegraph 1860



*‘Message received from any individual, company, or corporation, or from any telegraph lines connecting with this line at either of its termini shall be **impartially transmitted in the order of their reception**, excepting that the dispatches of the government shall have priority’ - US federal law*

June 1860

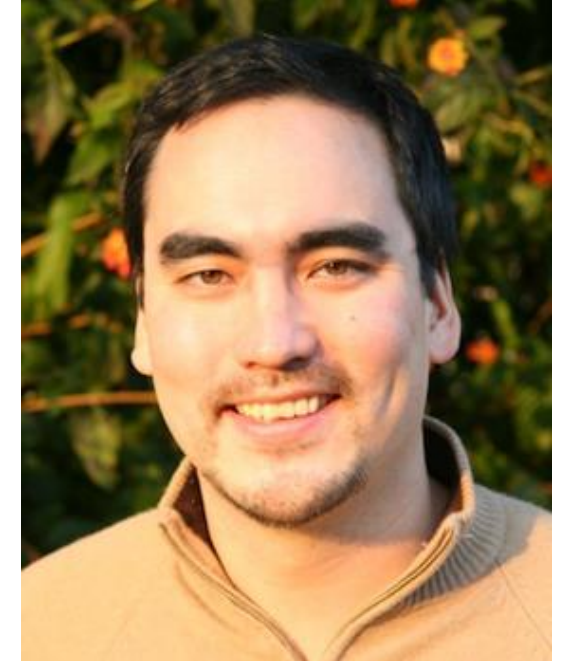
Competition



- In 1888 Almon Strowger suspected that his calls were redirected to a competitor
- One competitor's wife was a phone operator
- Created an automatic telephone exchange in 1891

Net Neutrality

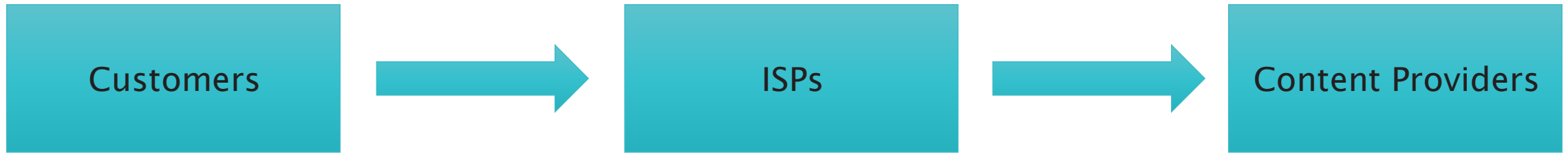
- Coined in 2003 by Tim Wu
 - “Network Neutrality, Broadband Discrimination”
 - Neutrality between applications and data
 - Quality of Service-sensitivity traffic
 - Proposal of legislation to deal with these issues
- Advocating for neutrality
- “Hoped that the general framework described here might serve to begin the effort to **discourage the most blatant or thoughtless disfavoring of certain applications types through network design**”



http://www.jthtl.org/content/articles/V2I1/JTHTLv2i1_Wu.PDF

Net Bias

Actors



Discrimination

- Throttle
- Block
- Paid access

Favouring Fast-Loading Websites

- Throttling a website can have a serious commercial impact
- In 2009 Forrester Research found
 - Online shoppers expected the web pages they visited to download content instantly.
 - When a page fails to load at the expected speed, many give up
- Other studies find even a one-second delay could lead to
"11% fewer page views, a 16% decrease in customer satisfaction, and 7% loss in conversions"
- In 2010, Google announced that page speed would impact your website ranking

Zero-Rated Services and Sponsoring Data Plans

- Zero-rated services provide Internet access without financial cost under certain conditions
- Often only permitting access to certain websites or by subsidizing the service with their advertising
- Gather customer profile information
- Cheap broadband packages sponsored by third parties
- Reduce costs to consumer by using sponsored data plans

Discrimination by Protocol

- Blocking information based on aspects of the communications protocol
- Federal Communications Commission's vs Comcast
 - Alleging Comcast illegally inhibited users of its high-speed Internet service from using BitTorrent

Discrimination by IP Address

- Blocking information based on source of destination of the network traffic
- Charge content providers for access
 - In France, Orange charged Google for YouTube traffic
- Preferential access
 - ISPs would impose bandwidth limitations on customers
 - But would strike commercial deals with content providers to allow their service to be “Zero-rated”

Favouring Private Networks

- A private network is a network that uses private IP addresses
- Avoid any regulation because packets originating from or addressed to a private IP address cannot be routed through the public Internet
- Setup their own “non-internet” networks
- For example, Comcast struck a deal with Microsoft
 - Allow Xbox 360 Xfinity app to stream television
 - No effect on their bandwidth limit
 - Other television streaming apps (Netflix, HBO Go, and Hulu) counted towards the limit
 - Comcast denied that this infringed on net neutrality principles since
"it runs its Xfinity for Xbox service on its own, private Internet protocol network"

How would the internet change without Net Neutrality?

- More Advertising
- Censorship and Blocked content
- How fast you receive content

ISPs Advertising

- ISPs can access detailed profiles about it's users
- ISPs can control what to allow on their network
- ISPs if allowed could bring in revenue from monetising profile with advertising

"AT&T has an amazing amount of data, customer data"... "You pair a very formidable ad inventory with a very formidable amount of data, information on the customer, viewership data, all kinds of other information and you can create something unique, just from a straight advertising platform and change how your monetizing content. We actually believe there's a strong opportunity to do this"

AT&T CEO Randall Stephenson

"Are we going to challenge Google and Facebook in this process? ...we plan on being a significant player"

Lowell McAdam, former CEO of Verizon

Censorship and Blocking

- Each ISP has its own way of categorising and filtering content
- In the UK no independent blocking list
- Problems of over filtering

Internet Speed

- Some internet services might be slower to access
- Cause higher prices for you
- Less competition, less pressure to improve services

For Net Neutrality

For	Argument
Accessibility	<p>Access to the Internet and the Web is considered a human right</p> <p>An open, public system consisting of privately owned components</p> <p>Maintaining a standardization for internet data transmission is essential for growth</p>
Experimentation	<p>The web we see today benefited from an open internet</p> <p>Should provide equal access for start ups and big companies</p>
Free Speech	<p>ISPs should not become gatekeepers of the internet</p> <ul style="list-style-type: none"> • Push their service vs a competitors • Control access to certain sources of information • Pay for speech
Unbiased	<p>ISP should not control what the internet is used for</p> <p>No discrimination for types of the data</p> <p>Protect content and content providers</p>
Choice	<p>Promotes competition amongst content providers</p>
Innovation and Creativity	<p>Supports innovation and new businesses</p>

Against Net Neutrality

Against	Argument
Provide investment for infrastructure improving accessibility for all	<p>Internet Infrastructure is not free</p> <ul style="list-style-type: none"> • Government are increasingly requiring internet access for all; affordable, rural coverage • Need to expand the internet but in an affordable way • Net Neutrality limits the options ISPs have to raises funds <p>Profits will go to share holders</p>
Regulation	<ul style="list-style-type: none"> • To support privacy in case law • Stop illegal content through blocking domains
Increases the quality	Not open, but brings positive change by providing access to useful information
Bringing internet to 3 rd world countries	Poor connectivity and cheap non-smart phone devices
Anti-competitive	<p>ISPs are competing with each other to provide better and cheaper services</p> <ul style="list-style-type: none"> • They need to find competitive elements to do this • ISPs need freedom to operate in different ways • Net neutrality might stifle network innovation and can kill competition

Learning Outcomes

- Net neutrality is a complex topic
- There are many arguments for and against net neutrality