


Internet regulation & governance
Introduction

CSCI E 45a: The Cyber World – part A

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Introduction: learning goals



- Understand the history of telecommunications regulations and governance and the many players involved

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Introduction: this module



- This module deals with regulatory policy

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Regulation vs governance

What does governance mean in the Internet context?

- governance means answering two questions:
 - Who says who makes the rules?
 - Who says who pays for them?
- every time a new internet technology enters internet regulation, TV content, internet banking, online fax, internet signal, etc., comes a hurdle
- not based on the Internet
- unintended consequences and abuses
- not based on effectiveness but just what we are willing to do in the current phase

Bradner – 1999-02-24

- Regulation imposes rules
- Governance is deciding who has the right to make specific rules

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Topics



Apr. 20.
Les Éléctes Parisiens constitués se réunissent la semaine d'après la transmission de toute dépêche privée qui paraît dangereuse pour la sécurité de l'État, ou qui serait contraire aux lois du pays, à l'ordre public, ou aux bonnes mœurs, à charge d'en rendre immédiatement l'administration de laquelle dépend le bureau d'origine.



- History of telecommunications governance & regulations – R
Governance & regulations starting with the telegraph
- History of Internet regulations - R
A review of the limited Internet specific regulations
- Internet governance – R
The evolving Internet governance picture

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Internet regulation & governance
History of telecommunications governance and regulations

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Telegraph & telephone governance & regs.

- Concepts
 - Developed in Europe in mid 1800s
 - Create new international telecommunications governance body
 - Same body developed regulations that defined operational and technical interactions between nation-based carriers
 - Included billing basics
 - Included protections for the nation



Europe 1865

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Long distance communication – part 1

WHAT HATH GOD WROUGHT



1793



1844

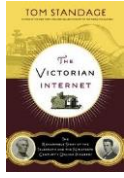


1858

1875 – 650,000 miles

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Telegraph system architecture



- Only state-owned or state-licensed providers
- Confined to a state (nation)
- Approved services
- Revenue source for state
- Bilateral interconnect agreements

Telegraph service governance



International Telegraph Conference 1865

- 1865 – 20 European governments gathered in Paris
 - Met in the International Telegraph Conference
 - Produced the International Telegraph Convention (ITC)
 - Created the International Telegraph Union (ITU) to maintain the convention

ITC 1865: governance & regulations



International Telegraph Convention 1865

- Tariffs & settlements
- Technical standards
- Retention requirement
- Complaint process
- ...
- Aims included protecting state & morality

ITC 1865, contd.

Art. 20
Les Hautes Parties contractantes se réservent le
droit d'arrêter la transmission de tous dépêches
particuliers qui paraissent dangereuses pour la sécurité de
l'Etat, ou qui sont contraires aux lois du pays,
à l'ordre public ou aux bonnes mœurs, à charge
d'en avertir immédiatement l'Administration de la
partie dépositaire des dépêches.

Article 20
International Telegraph
Convention
1865

The High contracting Parties reserve the ability to stop any private communication that would appear to endanger the security of the State, or would be violating the laws of the country, the public order or moral standards/values, and shall immediately notify the administration of the country of origin.

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Communications governance – version 1



- Governance by governments
- Regulations covered more than just technology
- Also protect state, money and morality
- Westphalian ideal?
Treaty of Westphalia (1648)
Codified the nation-state

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ITU

International Telegraph Union -> International Telecommunication Union



1865 1885 1906 1934 1949

↑
because ITU "covered all forms of
wireline
and wireless communication"

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Telephone system architecture



- Only state-owned or state-licensed providers
- Confined to a state (nation)
- Approved services
- Revenue source for state
- Decade-long planning cycle
- Circuit-based “intelligent network”
- Guaranteed QoS and security
- Interconnection under ITU rules

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Telecom regulations, US national



- 1912 – radio communication regulated by Secretary of Commerce and Labor
- 1927 - Federal Radio Commission (FRC)
- 1934 - Federal Communications Commission (FCC) formed by Communications Act of 1934
Covers all types of communications

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AT&T



- 1874: Bell Patent Assoc.
- 1875: Bell Telephone Co.
- 1913: Kingsbury Commitment
Established AT&T as a government-sanctioned regulated monopoly
- 1982 – AT&T divestiture
7 “Baby Bells” regional telecoms
- Now – 3 left
AT&T, Verizon & CenturyLink

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Communications Act of 1934



An Act to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies.

- Amended in 1996

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1996 revision: sections (Titles)



- I: General Provisions
- II: Common carrier
- III: Radio
- IV: Procedural and administrative provisions
- V: Penal & Forfeitures
- VI: Cable
(from the Cable Communications Policy Act of 1984)
- VII: Miscellaneous

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Common carriage




- *“Any man undertaking for hire to carry the goods of all persons indifferently ... is ... a common carrier.”* (Gisbourn v. Hurst – London Court - 1710)
- Must serve all customers equally
Including not refusing customers
- Started with freight carriers
E.g., trucking companies, railroads, bus lines, airlines, public utilities, etc.

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Common carriage for US telecom



- Title II of Communications Act
- Very detailed rules
 - E.g. over 700 individual regulations
 - Accounting, record keeping, interconnections, numbering, universal service, infrastructure sharing, tariffs, new line, discontinuing service, rate of return, access charges

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Internet regulation & governance
History of Internet regulations

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Internet regulation



- Until 2015, what Internet regulation?
- Telephone companies ignored Internet
Thus, regulators did the same
- Overlay, not new, network
- Experts: does not/cannot work
- FCC classified Internet as an unregulated “information service”

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Internet regulations, international



- Lots of noise but little action
- E.g., ITU
Various attempts to make the ITU THE Internet regulator since 1990s
e.g. SG3 work on Internet settlements in 2000
World Summit on the Information Society – 2003
World Conference on International Telecommunications - 2012
- Individual countries
e.g., China, India, Egypt, ...

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Internet regulations, US



Bill Clinton

- Communications Decency Act of 1996 (CDA)
Controls to make the Net 'safe for kids'
Also protects Internet services from liability for customer postings
Content controls ruled unconstitutional

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CDA



Vs



Janet Reno

JUDGE DALZELL: *And indeed, isn't the whole point that the very exponential growth and utility of the Internet occurred precisely because governments kept their hands out of this and didn't set standards that everybody had to follow?*

THE WITNESS: *The U.S. Government and many other governments attempted to mandate a particular kind of protocol to be used on worldwide data networks, and this is the OSI protocol suite.*

That particular suite of protocols has failed to achieve market success. What achieved success was the very chaos that the Internet is. The strength of the Internet is that chaos. It's the ability to have the forum to innovate.

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CDA, contd.



Judge Dalzell

JUDGE DALZELL (in the opinion granting a preliminary injunction)

True it is that many find some of the speech on the Internet to be offensive, and amid the din of cyberspace many hear discordant voices that they regard as indecent. The absence of governmental regulation of Internet content has unquestionably produced a kind of chaos, but as one of plaintiffs' experts put it with such resonance at the hearing: "What achieved success was the very chaos that the Internet is. The strength of the Internet is that chaos."

Just as the strength of the Internet is chaos, so the strength of our liberty depends upon the chaos and cacophony of the unfettered speech the First Amendment protects.

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Internet regulations, US, contd.



- Many state-level attempts since
Many far too broadly written & stopped
- Communications Assistance for Law Enforcement Act (CALEA) - 1994
Extended to Internet in 2006, requires ISP registration

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Internet regulations, US, contd.



Michael Powell

- 2005 - FCC network neutrality principles
"any lawful content, any lawful application, any lawful device, and any provider"
- 2009 – added nondiscrimination & transparency principles
- Repeatedly contested in court
- 2014 – proposed "network neutrality" with "pay lanes"
3.7 million comments
Almost all opposed to pay lanes

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Internet regulations, US, contd.



Tom Wheeler

- 2015 – FCC reclassified Internet service providers as falling under Title II of communications act
- But said they would "forebear" on over 700 individual regulations
- Just use Title II to empower the network neutrality rules
- A few "bright line rules"

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ISPs under Title II



- **No Blocking:**
broadband providers may not block access to legal content, applications, services, or non-harmful devices.
- **No Throttling:**
broadband providers may not impair or degrade lawful Internet traffic on the basis of content applications, services, or non-harmful devices.

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ISPs under Title II, contd.



- **No Paid Prioritization:**
broadband providers may not favor some lawful Internet traffic over other lawful traffic in exchange for consideration of any kind.
This rule also bans ISPs from prioritizing content and services of their affiliates.

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ISPs under Title II, contd.



- **Reasonable Network Management:**
For the purposes of the rules, other than paid prioritization, an ISP may engage in reasonable network management.

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ISPs under Title II, contd.



- FCC reclassification upheld
- Appeals court 2-1 ruling June 2016 upheld FCC reclassification of ISPs under Title II

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ISPs not under Title II



- In December 2017 the FCC (under new leadership) repealed reclassification of ISPs as being subject to Title II
- "Restoring Internet Freedom Order"
- After receiving and ignoring over 21 million comments on proposal

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ISPs not under Title II, contd.




- Very widespread public opposition to repeal
- Congress tried & failed to reject new FCC regulation
- Many states have passed their own NN laws the FCC included preemption in new regulation

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ISPs not under Title II, contd.



- On October 1 2019, a federal appeals court ruled that the FCC acted legally in repealing the Title II designation but that it acted unconstitutionally when it said that states could not pass their own rules
- Thus, the states can rule California has

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Non US regulation



- Many governments regulate Internet content
 - Most to 'protect the kids'
 - Some to protect society
- But regulations are per-country
- Some started then stopped
 - Hurt business too much

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Internet governance

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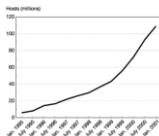
Inconceivable relevance until ...



- Existing telecom world did not believe in the Internet
Conventional wisdom: best effort useless
Guaranteed QoS required
No threat seen to telephone companies
- Thus, totally ignored by regulators including the ITU

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But the Internet Grew



- Doubling annually
- Exploding in mindshare
- But still no meaningful regulation or governance
- From inside the net you could not see national borders
i.e., it was cyberspace, and looked like it was not of this world

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Internet governance issues



kitchen sink

regulations, settlements, technology standards, peering, security, emergency use, espionage / monitoring, national boundaries, attribution, societal disruption, business disruption, trademark, copyright, operation of critical infrastructure, censorship, spam, have/have not balance, domain names, resource assignment policies, government roles, network neutrality, exchange point management, market dynamics, subsidies, competition, cybercrime, cyberwar, patents, identification, attribution, ...

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Managing cyberspace



DISTRIBUTED ICL

- Internet technology does not require centralized management
- Bilateral agreements between ISPs
 - Defined connectivity & architecture
- Exceptions:
 - Protocol parameters, IP addresses & domain names

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Internet Assigned Numbers Authority



Jon Postel



- IANA
- Coordinates & assigns Internet-related unique values
 - Protocol parameters
 - IP addresses
 - Top-level domains and DNS server addresses
- Originally funded by ARPA (DARPA)

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Protocol Parameters



- Used to differentiate between options and payloads in protocols
e.g., port 25 = email, port 22 = secure remote login
- IANA maintains a registry of protocol parameters for the Internet Engineering Task Force (IETF)

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IP Addresses

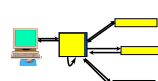


- Allocated by IANA to regional IP registries (RIRs)
Allocated by RIRs to ISPs
Allocated by ISPs to customers
- Each RIR has its own policy development process
- Additional global policy process

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Domain Names



> 1500 TLDs
> 300 ccTLDs

- Translate human-friendly alphanumeric names into IP addresses
- Uses distributed set of database servers (DNS servers) run by different organizations
- Top level domains (TLDs) assigned by IANA
IANA maintains map between TLDs and server addresses

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“Shine perishing republic”



John Perry Barlow

- The brief reign of the republic of cyberspace
- *A Declaration of the Independence of Cyberspace* - 1996

“Your legal concepts of property, expression, identity, movement, and context do not apply to us. They are all based on matter, and there is no matter here.”

- *‘the Internet will get rid of countries’*

Participant, *International Forum on the White Paper (IFWP)* - 1998

The beginning of the end



VS.



- Jan 1998 – Jon Postel “redirected the root”
Asked the root server operators to retrieve zone from his server (instead of the government run one) - and 7 did

Aftermath



Ira Magaziner

- Ira Magaziner threatened to send in the Marines (literally)
- Jon relented after a short while & ICANN was formed soon after
With strong “guidance” from the US Government
- ITU redoubled efforts to gain control

Illusionary interregnum



- Cyberspacers were filling a governance vacuum with imaginary structures
- There are still cyberspacers out there
- But so are the ITU, national regulators & the copyright industry
- And users, money, the Arab Spring, and the NSA

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ICANN



- Internet Corporation for Assigned Names and Numbers
Setup by US government in 1998
- Had contract for the IANA function from U.S. DoC
- Remit includes
 - protocol identifiers (for IETF)
 - IP Address pool
 - DNS TLDs & server map
 - DNS root name servers

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ICANN Role

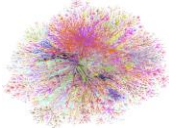


- Formally, ICANN just coordinates IANA functions
- But, also has expanded top level domain space
Thousands of new TLDs
- Also, seen as top of the pyramid of Internet functions & operations
Even though it does not have any such authority

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Some Example Issues



- **Peering relationships**
Telephone: peering requirements defined in regulations
Internet: big ISPs refuse to peer with smaller ISPs
Local peering points are voluntary - no mandate
- **International settlements**
Telephone: caller pays terminating carrier
Internet: customer pays local ISP

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Some Example Issues, contd.



- **Quality of service**
Telephone: service must meet specific quality
Internet: only offers best effort service
- **ccTLDs**
- **Countries want to be in charge of their Internet identity**
.iq tied up in a Texas bankruptcy court for two years

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Biggest Issue

- **Society disruption**



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Current State

The Internet is now far too important to leave it to the people that know how it actually works

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Internet Governance



- **What is the court for the Internet?**
A state court in Kentucky?
- **No one in charge**
Internationally or domestically in many countries
- **U.S. has some control through ICANN**
ICANN does technical coordination protocol values, DNS & addresses

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Internet Governance, contd.




- **Power vacuum?**- some governments think so
- **They want the ITU to fill the perceived vacuum**
Government-based decision process

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ITU efforts



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ITU Proposals



- Proposals come from “member states”
- Many of which want the ITU to take over the governance of the Internet
 - Policy, settlements, technical standards, regulations
- Recall that the ITU is government controlled

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ITU's Authority



- The ITU assumes that if the member states agree to something then the ITU has the authority
 - Derived from the governments
- E.g., at one point they thought they could require the IETF to submit its standards to the ITU for ratification
 - Note the IETF is a private group

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U.S. moral authority



Edward Snowden

- U.S. has “run” the Internet since the start
Currently controls DNS & address roots thorough ICANN
- Other countries have “gone along”
US fended off alternative management – e.g. ITU
- Snowden revelations have changed the picture
Reduced the moral authority of the U.S.

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DoC Says “Maybe”



- In March 2014 the U.S. Department of Commerce announced the intent to transition out of a contract for the IANA functions

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DoC Says “Maybe”, contd.



- Solution must have “broad community support and address the following four principles:
Support and enhance the multistakeholder model;
Maintain the security, stability, and resiliency of the Internet DNS;
Meet the needs and expectation of the global customers and partners of the IANA services;
and,
Maintain the openness of the Internet.”

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Giving Away the Internet!



DONALD TRUMP COMES OUT AGAINST OBAMA'S UNITED NATIONS INTERNET TAKEOVER

Cruz slams Obama for 'internet giveaway'

Obama gives away the internet and, with it, our liberty

Obama Should Not Put Free Speech on Internet at Risk by Giving Up US Oversight

Four states sue to stop internet transition


A Federal Judge Just Let Obama Give Away The Internet

Republicans Say Obama Administration Is Giving Away The Internet

7 Days Before Obama Gives Away Internet & National Security

28

Independent ICANN




- Combined community IANA proposals submitted to NTIA
- NTIA said the proposal met its requirements
- NTIA let contract expire on 1 October 2016
- ICANN is now on its own

Note: if the transition had not happened the UN would likely have voted to take ICANN over

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What the IANA Episode Points Out



- There is no one and no organization that runs the Internet
- There is no "Internet governance" as a thing
- The Internet is the result of millions of cooperating people and organizations
- All that binds these entities together are technical standards

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Internet regulation & governance
Conclusion

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Governments govern telecom



- Telecom regulations and governance are interrelated


Started with governments worrying about interconnection and protecting themselves



- Evolved into an international system centered in the ITU

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The Internet is different



- Long ignored because it 'could not work' and was 'irrelevant'
- Evolved to be wholly commercial bilateral agreements

Except where governments try to control content

- Became too important to not have governments in control

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