Module 1a: who controls the Internet?

Technical standards:
- Who defines protocols?
- Who controls names and addresses?

Internet content:
- Who controls who can post, or read what content on the Internet?

Technical Standards: Network protocols

protocols define format, order of msgs sent and received among network entities, and actions taken on msg transmission, receipt

- in order for computers, routers around planet to communicate, they must agree on communication protocols
  - every web server, browser agree on HTTP protocol
- technical standard: specifications that everyone agrees to follow
- electrical standards:
  - every US electrical plug is exactly the same, and all AC electricity runs at same voltage
  - different electrical standards in different country
- can you image a world without standards?
Internet Technical Standards: IETF

- Internet Engineering Task Force (IETF) defines protocol standards for Internet
- IETF activity part of non-profit Internet Society
- Volunteers run working groups that define technical standards
  - As Internet has become “big business” volunteers have shifted from most research community to mostly business concerns
- Internet protocols standardized (defined) in Request for Comment documents (RFC’s)
  - Defines format, order of messages sent and received among network entities, and actions taken on msg transmission, receipt

RFC 2551: HTTP

- HTTP protocol: used by web browsers and servers

3.3.1 Full Date

HTTP applications have historically allowed three different formats for the representation of date/time stamps:

- Sun, 06 Nov 1994 08:49:37 GMT (an update to RFC 822 [9])
- Sun Nov 6 08:49:57 1994 (an obsolete RFC 822 format)

The first format is preferred as an Internet standard and represents a fixed-length subset of that defined by RFC 1123 [8] (an update to RFC 822 [9]). The second format is in common use, but is based on the obsolete RFC 822 [9] date format and lacks a four-digit year. HTTP/1.1 clients and servers that parse the date value MUST accept all three formats (for compatibility with HTTP/1.0), though they MUST only generate the RFC 1123 format for representing HTTP-date values in header fields. See section 19.3 for further information.

Note: Recipients of date values are encouraged to be robust in accepting date values that may have been sent by non-HTTP applications, as is sometimes the case when retrieving or posting messages via proxiesgateways to SMTP or NNTP.

From page 18 of RFC 2616
**Cellular/Telephone Technical Standards: ITU**

- International Telecommunication Union (ITU) sets standards for telephony, cellular networks
  - agency of United Nations (!), located in Switzerland
- standards allow a cell phone from the US to operate in the EU
  - well … mostly .. since there are multiple standards and given phone may operate according to one or more standards
- Other standards bodies: Institute for Electrical and Electronics Engineers (IEEE)
  - ethernet standards

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**Who controls the Internet: what’s in a name?**

- Who determines that ibm.com
  - belongs to the International Business Machines Corp (IBM)?
  - rather than Icelandic Ballbearing Manufacturing (IBM)?
- ICANN: Internet Corporation for Assigned Names and Numbers
  - non-profit incorporated in 1998 in California
  - manages ownership of “names” like “ibm.com” or “kurose.com”
  - Uniform Domain-Name Dispute-Resolution Policy: process for disputing Internet name ownership
  - also manages assignment of 32-bit IP Internet addresses to enterprises (there’s only $2^{32}$ of them!)
ICANN policy and names

- **cyber-squatting**: owning Internet name but not having “legitimate interest”
  - making a fast buck: get an Internet name, then sell to company
- **ICANN requirements for having to give up Internet name**
  - name identical/confusingly similar to trademark/service mark
  - … and registrant does not have any rights or legitimate interests in name
  - … and name being used in "bad faith"

Madonna (the Madonna) versus Dan Parisi, web site developer who registered madonna.com
Clue Computing (computing consulting) versus Hasbro (Clue game) for clue.com

Who controls Internet content?

- no worldwide organization (such as UN, IETF, ICANN) controls what can be sent/received via Internet
  - local (e.g., country) laws, practices prevail
  - analogy: TV, newspaper content

- interesting case study: China
  - 560M Internet users
  - 10’sM microbloggers: new channels for expression
  - Estimate \([\text{Economist}]: 100K\) people in China working on censorship at firewalls, web sites, content platforms including search, video, microblogs
  - Sina Weibo: Chinese blogging site has estimated 4K censors
Great Firewall of China

- **firewall**: Internet router that can be configured to:
  - block, stop disrupt traffic (packets) going to/from a given destination (e.g., twitter.com)
  - copy packets going to/from given destination and send copies elsewhere (e.g., to monitoring devices/people)

- **Internet traffic**:
  - enters/leaves China via small number of optical fibers

- **Great Firewall of China**: gateway routers in China connected to these fibers serve as firewalls
  - block/filter undesirable foreign Internet traffic by site (e.g., Facebook, YouTube, Twitter) or by content
  - copy packets for automated or human inspection

China: Golden Shield

- copies, records, analyzes Internet traffic within China (not just at international gateways)
  - filters keyword searches on search platforms
  - can generate alerts for sensitive content
  - enters/leaves China via small number of optical fibers
  - some criticism (e.g., low level government officials) may be tolerated, other (e.g., high-level officials) not

- **adaptive authoritarianism**:
  - microblogging allows some freedom of expression, but content may be censored
  - content may be steered/manipulated: 50 Cent party: government workers paid .5 yuan (~ $0.08 USD) per message to direct content/online discussion in certain ways
From: Chen Hua, deputy director of the Beijing Internet Information Administrative Bureau

Dear colleagues, the Internet has of late been full of articles and messages about the death of a Shenzhen engineer, Hu Xinyu, as a result of overwork. All sites must stop posting articles on this subject, those that have already been posted about it must be removed from the site and, finally, forums and blogs must withdraw all articles and messages about this case.

Fallows, “The connection has been reset,” *The Atlantic*, 2008.

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**Privacy/censorship: not just in China**

• of course … issues of privacy and censorship happen in many countries … more later