Citation Key
for more information see: http://open.umich.edu/wiki/CitationPolicy

Use + Share + Adapt

{ Content the copyright holder, author, or law permits you to use, share and adapt. }

- Public Domain – Government: Works that are produced by the U.S. Government. (USC 17 § 105)
- Public Domain – Expired: Works that are no longer protected due to an expired copyright term.
- Public Domain – Self Dedicated: Works that a copyright holder has dedicated to the public domain.
- Creative Commons – Zero Waiver
- Creative Commons – Attribution License
- Creative Commons – Attribution Share Alike License
- Creative Commons – Attribution Noncommercial License
- Creative Commons – Attribution Noncommercial Share Alike License
- GNU – Free Documentation License

Make Your Own Assessment

{ Content Open.Michigan believes can be used, shared, and adapted because it is ineligible for copyright. }

- Public Domain – Ineligible: Works that are ineligible for copyright protection in the U.S. (USC 17 § 102(b)) *laws in your jurisdiction may differ

{ Content Open.Michigan has used under a Fair Use determination. }

- Fair Use: Use of works that is determined to be Fair consistent with the U.S. Copyright Act. (USC 17 § 107) *laws in your jurisdiction may differ
  
  Our determination DOES NOT mean that all uses of this 3rd-party content are Fair Uses and we DO NOT guarantee that your use of the content is Fair. 
  
  To use this content you should do your own independent analysis to determine whether or not your use will be Fair.
How Did This Mess Arise?

A brief history of computers and the Internet

510 - Data Security and Privacy: Legal, Policy, and Enterprise Issues
University of Michigan School of Information
Week 11
Roots

- The abacus?
- The telegraph – 1840s
  - Electronic signal standard still used in network interface cards
More to the Point

- Hollerith machines – 1886
  - Punch cards
  - Used for census
  - Still best systems into 1930s and 1940s

- ENIAC – unveiled 1946
  - First digital computer
  - From military World War II research effort

- IBM 360 – 1964
  - Mainframes took hold

- PCs – 1970
  - Datapoint 2200
  - 1977 – Apple II, Commodore PET, TRS-80
Roots II

- Sputnik – 1957
- Advanced Research Projects Agency (ARPA) created within DoD – 1958
  - Computer system development, strong communications and command/control were among mandates
  - Later became Defense ARPA (DARPA)
- Packet-switched network concept formalized – 1962-1964
Internet System Evolution

- A global network of networks
  - to share information and see how communications might be continued in the event of nuclear war
- Begins as DoD network in 1969
  - First packet switched network
- Splits into two networks (civilian and military) in 1975
- National Science Foundation takes over in 1986 - NSFNet
ARPAnet

• First packet-switched *network*

• DARPA (Defense Advanced Research Projects Agency) contracted with BBN (Bolt, Beranek & Newman) to create ARPAnet – 1968

• Online - 1969

• All of first five nodes up - 1970
  • UCLA
  • Stanford
  • UC Santa Barbara
  • U of Utah, and
  • BBN (later BBN Planet, an early ISP)

• First public demonstration - 1972
Backbone

- Series of high capacity links that carry large volumes of network traffic
Mid 1980’s- U.S. National Science Foundation (NSF) provided funding for individual and regional networks throughout the US (for research and academic use)
1986- NSF began linking networks using TCP/IP- protocol developed for ARPANET = NSFNET
Late 1980’s/early 1990’s – privatization of the backbone led to end of NSFNET (April 30, 1995)

AOL, MCI and others have since taken over the backbone

Now there are multiple backbones

Critical Core Elements Added

- TCP/IP
  - Specification published – 1973-74
  - Became core protocol when system, with approximately 1000 hosts, converted to using it for messaging – 1983-1984
- DNS introduced - 1983
source

A  B  C  D  E  F  G  H

destination
TCP – Transmission Control Protocol
Breaks down and reassembles packets of information

IP – Internet Protocol
Responsible for making sure packets reach the correct destination
Management History

- ARPANET in the DoD days
- 1986 - NSF takes over
- 1990s – NSF gradually spins system off to US Department of Commerce. Network Solutions managed under contract
- 1998 – ICANN/new IANA
Evolution to Modern Internet

• 1989 – Tim Berners-Lee creates WWW
  • to allow physicists all over the world to share graphical AND text based information

• Spelled end for command line tools
  • Gopher – distributed document system
  • WAIS – Wide Area Information Server - search
  • Finger
    • Security issues also part of its disappearance
The ‘Net Mushrooms

- 1990 – First commercial services appear
- 1991 – Commercialization restrictions removed
- 1992 – WWW released by CERN
- 1992 – Mosaic, first graphical browser, introduced
- 1994 – Netscape incorporates
Arpanet - 1971
The Internet-Academic 1984

Diagram showing the connections between various networks such as NSFnet, CERFnet, OARnet, NEARnet, NYSERnet, PREPnet, SURAnet, PSI, AOL/ANS, MCI, and THEnet.
The Internet - 2008

Source: Undetermined

CC: BY NC SA 2010 – Don M. Blumenthal
Early Ethos

• Segue to the “mess” part
• Messaging and exchange of information
• Open
• Small; everybody knew everybody
  • Whois database for reporting problems
• Hacking was a challenge/sport
  • Led to jobs
Issues with Openness

- Published standards
- Non-proprietary
- Led to security problems and other nuisances
E-Mail

- SMTP
  - dblumenthal@ftc.gov
- X.400
  - s=blumenthal
  - g=don
  - c=us
  - a=telemail
  - p=gov+ftc
  - o=wpo
  - dda.wpmail=HQ01(dblumenthal)
  - s=blumenthal;g=don;c=us;a=telemail;p=gov+ftc;o=wpo;dda.wpmail=HQ01(dblumenthal)