WEB TECHNOLOGY

Chapter 1: WEB ESSENTIALS

Lecture Zero/One

Compiled by:

Suwal@serij.com.np

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The Computer Science Department at the University at Buffalo

https://engineering.buffalo.edu/computer-science-engineering.html

What is the Internet?
History

- The Internet links the diverse peoples of the world in electronic conversations and commerce.
- The Internet seems to have sprung up overnight.
- While that is NOT true, the perception is still rather valid.
- Since 1991 the number of Internet users has grown from less than 500,000 to hundreds of millions if not billions.

What is the Internet?
History

- The Internet was once the exclusive realm of US government agencies, universities and research organizations.
- Now it is open to just about anyone who has access to a computer anywhere in the world.
- Increasing access is one of the motives of the One Laptop Per Child initiative we discussed the first week of class

What is the Internet? Some Definitions

- Computer Network: is a group of computers and computer devices linked together over communications (wired and wireless) "lines" so that information, resources, and ideas can be shared.
- Local Area Network (LAN): is a network that covers a limited geographic area such as a group of offices, a building, or a number of nearby buildings.
- When a group of LANs are connected we have an internet. (this intentionally has a small "i")
- The Internet (capital "I") can be thought of as the linking of hundreds of thousands of LANs into one world-wide, seemingly random collection of interconnected devices.

What is the Internet?
History

- The Internet was born in 1969 out of the threat of war.
  - Four universities, University of California at Los Angeles, University of California at Santa Barbara, University of Utah, and Stanford Research Institute were linked together in the first ever truly wide-area-network.
  - This network was funded by the Defense Department.
  - ARPAnet: funding was through Advanced Research Project Agency
- ARPAnet had two purposes
  1. This was a cold-war era military project. A decentralized network of computers to coordinate military operations
  2. Great Idea: It was hoped that the network would enable scientists and researchers to share idea and information quickly and easily. (It's this second idea that changed the world)

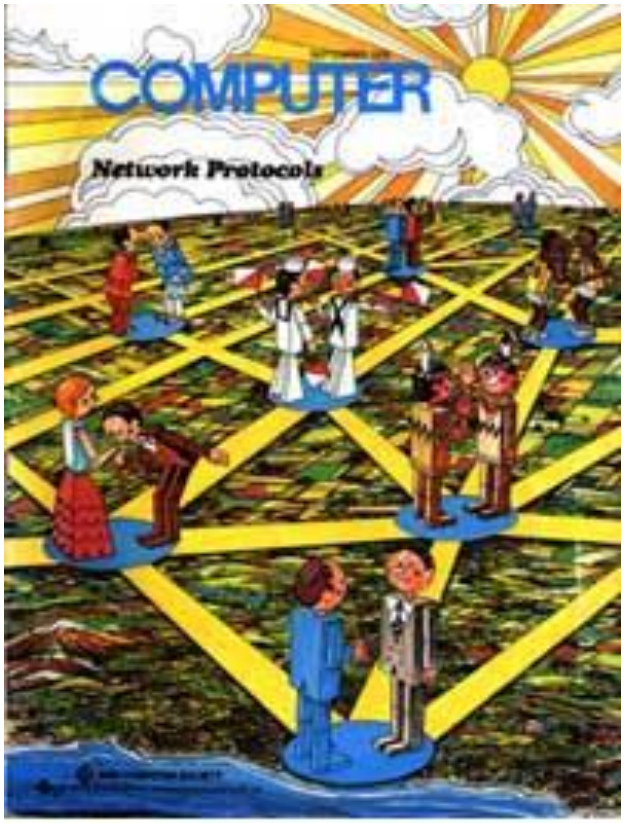
What is the Internet?
History

ARPAnet

- 1969 – 4 sites called hosts
- 1971 – 20 hosts and nationwide including schools such as Harvard, MIT, Utah, Illinois as well as California schools.
- 1972 – Ray Tomlinson writes a program that creates the ability to transmit electronic mail over ARPAnet.
- Great Idea: Tomlinson invented the 'user@host' convention.

What is the Internet? History

1979, Idea of the Internet grabs the attention of the growing Tech world.



Cover of Computer Magazine Sept. 1979

What is the Internet?
History- Early 1980s

- 1981 – 200 hosts
  - US allies express interest
  - IBM releases the IBM PC
  - Prior to this Internet existed as a network of large systems
- NSFnet
  - Mid-1980s, NSF created a high-speed electronic structure, or backbone,
  - connected the five national supercomputer centers with ARPAnet
  - Supercomputer centers available to researchers nationwide.
  - NSF worked to connect smaller regional networks to ARPAnet
  - Universities not the US military/government were major players
- 1983 – Gaming company – Video Crop founded running an independent dial-up network running on Apple IIs and Commodore 64s. Grandparent of America Online

What is the Internet?
History

- 1988 – First "worm" attacks ARPAnet effecting 6000 or the 60,000 computers then connected.
  - US govt. creates *Computer Emergency Response Team (CERT) to deal with such incidents.*
- 1988 -- Canada, Denmark, Finalnd, France, Iceland, Norway and Sweden come "online".
- Ordinary citizens cannot gain access to ARPAnet/Internet
  - Quantum Computer Services (who later changed their name to America Online) provide Internet-like service to general public for a fee.
    - Standard service – news, reference, email
    - Enhanced service – standard plus hardware and software forums
  - NOT connected to the Internet

What is the Internet?
History -- 1989

- January, 80,000 hosts
- November, 160,000 hosts
- More nations: Australia, Germany, Israel, Italy, Japan, Mexico, Natherlands, New Zealand and the United Kingdom
- Great Idea: Tim Berners-Lee invents the concept of hypertext systems that can run across the Internet independent of a computer's operating system. (This is the idea of a Browser!)
  - This enabled the formation of the World-Wide-Web as we know it today.
- MCImail and CompUServe join America Online in the email for a fee environment.
  - They are NOT connected to the Internet

What is the Internet?
History -- 1990

- ARPAnet is decommissioned. NSFnet takes over responsibility for service to universities and researchers worldwide.
- 300,000 host systems
- More nations come on board: Argentina, Austria, Belgium, Brazil, Chile, Greece, India, Ireland, South Korea, Spain and Switzerland.
- Tools are invented and special services provided in medicine and finance.
- Worm attacks increase

What is the Internet?
History -- 1992

- Internet get's its own professional society to direct policy and set direction
- Great Idea: Students at University of Indiana take Berners-Lee's idea and create the first browser called MOSAIC.
  - **Commercial spinoff is** Netscape.
  - **Now non-Techies can use the Internet**
- Until 1992, user community doubled every year, this year it doubled it's user base in 3-months.

What is the Internet?
History -- 1993

- The United Nations and the White House are added to the list of accessible sites.
- AOL goes after the general public
  - People with little familiarity with computers
  - User-friendly, kid-friendly, family friendly
  - Competitors are going after the Techies

What is the Internet?
History -- 1993

AOL for Windows

What is the Internet?
History – Late 1990s

- 1995
  - Independent services start providing Internet access.
  - Search Engines Yahoo and Altavista appear
- 1996
  - Microsoft releases Internet Explorer
  - Browser war and lawsuits of Microsoft as a monopoly begin
  - Great Idea: AOL Instant Messenger (AIM) released, changing the way people communicate over the Internet
- 1998
  - AOL buys Netscape, creates alliance with SUN Microsystems
  - Google arrives, **with a new kind of search mechanism using ranking rather than categories.**

What is the Internet?
History – The new Century

- 2000
  - Time Warner buys AOL. This was supposed to create a mega-competitor to Microsoft. NOT!
  - Dot com bubble bursts
- 2001 – Great Idea: **Google uses a new search idea, ranking of sites rather than categories.**
- **JuniperResearch Internet population forecast: Between 2006 and 2011, "38 percent increase in the number of people with online access will mean that, by 2011, 22 percent of the Earth's population will surf the Internet regularly.**"

What is the Internet?
History – Things to Think About

Some see the Internet as having two stages:

- Before Browsers (Mosaic and the World-Wide-Web)
  - A world of shared but "flat" information
  - Email, newsgroups, heavy US government involvement
- After Browsers
  - Truly a WORLD-WIDE web
  - Dynamic, 3-dimensional, ever changing, International

What is the Internet?
History -- Things to Think About

The Roads and Crossroads of Internet History

by Gregory Gromov

Epilogue and Prologue ...

The WWW creates a multidimencional Web of Roads. Those Roads have their beginning at the civilization that was raised on a concept of a plane BOOK; the civilization that has existed for thousands of years.

The Hyperlinks -- Roads of WWW -- lead from a BOOK of a plane text to the multidimencional Universe of WORDs, to the WORD's WORLD, which becomes the kernel concept of the next civilization...

Internet History Links

1. www.computerhistory.org/internet_history
2. www.netvalley.com/archives/mirrors/davemarsh-timeline-1.htm
3. www.informationweek.com/shared/printableArticle.jhtml?articleID=1931047230
4. **en.wikipedia.org/wiki/AOL#History**
5. **www.hm-treasury.gov.uk**
6. **www.netvalley.com/archives/mirrors/davemarsh-timeline-1.htm**
7. **www.netvalley.com/intval/07262/main.htm?sdf=1**
8. **en.wikipedia.org/wiki/History_of_the_Internet#Digital_divide**
9. Kershner, H.G., "Computer Literacy 3rd Ed.," 2000

What is the Internet?
History -- 1992

- Digital Divide
  - Haves vs have-nots
  - Rich vs poor
  - First World vs Developing world

What is the Internet?
So Who Owns the Internet?

- It was started by the US government.
- It's goal was to create a complex, redundant, interconnected web of computers that could survive just about anything.
- The success of the Internet is obvious.
- Blackouts, earthquakes, hurricanes, tornadoes and floods interrupted service in the localized areas The rest of the system runs interrupted.
- The goal was to create a network with no central node, no core, no center.

What is the Internet?
So Who Owns the Internet?

- No One owns the Internet.
- Individuals, corporations, and governments own or control parts of it.

- The Internet does have coordination.
- Volunteers from many nations serve on advisory boards and steering committees to develop standards and provide coordination to the Internet.

What is the Internet?
So Who Owns the Internet?

- Great Idea: The Internet Society – is the Internet's central coordinate (www.isoc.org)
  - an international volunteer organization
  - sets Internet standards and policy in a cooperative way
  - Anyone can join
  - This open invitation makes the Internet a truly worldwide, democratic organization.

What is the Internet?
So Who Owns the Internet?

- Each associated network governs itself and agrees to live by the standards set by the volunteer Internet boards.
- Different organizations and nations create regulations and rules that govern the operation of individual sub-nets
  - Within the US individual states have different rules
  - Rules that govern the Internet in the United States are much more liberal than those that govern the Internet in China.
- These rules change constantly in response to the needs of the citizens and users in different locations.

What is the Internet?
So Who Owns the Internet?

- Other organizations play critical roles.
- InterNIC is a non-profit group
  - Originally created by the National Science Foundation
  - Now independently funded
  - Coordinates Internet registration throughout North America.
  - Anyone wanting a permanent connection (in North America) the Internet must register with InterNIC.
  - Organizes and keeps track of site names and site addresses,
  - Sets the rules on registration
  - Sites pay an initial registration fee and annual fees thereafter.
  - Coordinates and approves names on a first-come, first-served basic.
  - Rules governing names increasingly reflect copyright and trademark regulations and require continuous use of the names.
- Similar “NIC” exist throughout the world and coordinate their registrations.