Looking Back..  
The History of the Internet

• ARPANET (Advanced Research Projects Agency Network)  
• TCP/IP (Transmission Control Protocol/Internet Protocol)  
• NSFNET (National Science Foundation Network)  
• Desktop computers  
• Network upgrades  
• Web Technology

1950’s

1957 USSR launches Sputnik, first artificial earth satellite. In response, US forms the Advanced Research Projects Agency (ARPA) within the Department of Defense (DoD) to establish US lead in science and technology applicable to the military.

1960’s

1969 - The Department of Defense Advanced Research Projects Agency creates an experimental network called ARPANET. This network provides a test-bed for emerging network technologies.

ARPANET originally connected four universities
Node 1: UCLA - (September)   
Node 2: SRI - Stanford Research Institute (October)  
Node 3: UCSB  
Node 4: Univ of Utah

1960’s (continued..)

Information Message Processors (IMP) [Honeywell 516 mini computer with 12K of memory] developed by Bolt Beranek and Newman, Inc. (BBN) First node-to-node message sent between UCLA and SRI (October)  
First Request for Comment (RFC): “Host Software” by Steve Crocker University of Michigan  
Michigan State and Wayne State University establish X.25-based Merit network for students, faculty, alumni.

1970’S

1971 ALOHAnet developed by Norman Abrahamson, University of Hawaii, heart of Ethernet and connected to the ARPANET in 1972.  
1972 The National Center for Supercomputing Applications (NCSA) develops the telnet application for remote login, making it easier to connect to a remote computer.  
1972 FTP (file transfer protocol) is introduced, standardizing the transfer of files between networked computers.
1970’s

1972 Ray Tomlinson (BBN) writes basic email message send and read software (March) Larry Roberts writes first email utility to list, selectively read, file, forward, and respond to messages (July)


1976 Elizabeth II, Queen of the United Kingdom sends out an e-mail (various Net folks have e-mailed dates ranging from 1971 to 1978)

UUCP (Unix-to-Unix Copy) developed at AT&T Bell Labs and distributed with UNIX one year later.

1980’s

1983 Name server developed at Univ of Wisconsin, no longer requiring users to know the exact path to other systems

• Internet Activities Board (IAB) established, replacing ICCB
• Berkeley releases 4.2BSD incorporating TCP/IP
• EARN (European Academic and Research Network) established. Very similar to the way BITNET works with a gateway funded by IBM. FidoNet developed by Tom Jennings.
• 1984 Domain Name System (DNS) introduced. Number of hosts breaks 1,000
• JUNET (Japan Unix Network) established using UUCP

1980’s Continued...

• In 1982 and 1983, the first desktop computers began to appear. Many are equipped with an operating system called Berkeley UNIX, which includes networking software. This allows for relatively easy connection to the Internet using telnet.

• The personal computer revolution continues through the eighties, making access to computer resources and networked information increasingly available to the general public.

1980’s Continued...

1985-86: The National Science Foundation (NSF) connects the nation's six supercomputing centers together. This network is called the NSFNET, or NSFNET backbone.

To expand access to the Internet, the NSF supported the development of regional networks, which were then connected to the NSFNET backbone. In addition, the NSF supported institutions, such as universities, in their efforts to connect to the regional networks.

Here is a diagram of the NSF backbone, as it appeared in...
1980's
• 1987 - The NSF awards a grant to Merit Network, Inc. to operate and manage future development of the NSFNET backbone. Merit Network, Inc. collaborates with IBM and MCI to research and develop faster networking technologies.
• 1988-2 November - Internet worm burrows through the Net, affecting ~6,000 of the 60,000 hosts on the Internet.
• 1989 - The backbone network is upgraded to "T1" from 56Kbps which means that is able to transmit data at speeds of 1.5 million bits of data per second, or about 50 pages of text per second.

1990's
• 1990 - The ARPANET is dissolved.
• 1991 - Gopher is developed at the University of Minnesota. Gopher provides a hierarchical, menu-based method for providing and locating information on the Internet. This tool makes using the Internet much easier.
• 1992 - Internet Society (ISOC) is chartered
• Number of hosts breaks 1,000,000
• 1993 - The European Laboratory for Particle Physics in Switzerland (CERN) releases the World Wide Web (WWW), developed by Tim Berners-Lee. The WWW uses hypertext transfer protocol (HTTP) and hypertext links, changing the way information can be organized, presented and accessed on the Internet.

1995
• 1995 - RealAudio, an audio streaming technology, lets the Net hear in near real-time
• 1995 Radio HK, the first commercial 24 hr., Internet-only radio station starts broadcasting

Technologies of the Year: WWW, Search engines
Emerging Technologies: Mobile code (JAVA, JAVAscript), Virtual environments (VRML), Collaborative tools

1996
IP Meltdown: AOL (19 hours), Nets.com (13 hours); AT&T WorldNet (28 hours - email only)

New York's Public Access Networks Corp (PANIX) is shut down after repeated SYN attacks by a cracker using methods outlined in a hacker magazine (2600)

Various US Government sites are hacked into and their content changed, including CIA, Department of Justice, Air Force
MCI upgrades Internet backbone adding -13,000 ports, bringing the effective speed from 155Mbps to 622Mbps.

Technologies of the Year: Search engines, JAVA, Internet Phone

1997
2000th RFC: "Internet Official Protocol Standards"
The American Registry for Internet Numbers (ARIN) is established to handle administration and registration of IP numbers to the geographical areas currently handled by Network Solutions (InterNIC), starting March 1998.

Longest hostname registered with InterNIC: CHALLENGER.MED.SYNAPSE.UAH.

Technologies of the Year: Push, Multicasting
1998

Electronic postal stamps become a reality, with the US Postal Service allowing stamps to be purchased and downloaded for printing from the Web.

Network Solutions registers its 2 millionth domain on 4 May.

San Francisco sites without off-city mirrors go offline as the city blacks out on 8 December.

Technologies of the Year: E-Commerce, E-Auctions, Portals
Emerging Technologies: E-Trade, XML.

Summary

Comments

• One of the better kept secrets of the Web is that hypertext markup language, universally known as HTML, is pretty dumb. There’s a better option ready to debut: eXtensible Markup Language, or XML. The fatal flaw in HTML is that it has no attributes for handling the business world’s complex and endless demands for searching the Web. HTML makes Web pages easy for humans to read but hard for search engines to decipher in a meaningful way, particularly the pinpoint culling of information to the specifications of demanding Web surfers who want 10 highly specific references, not 150,000 random keyword references.


Growing Security Concerns

Online Shopping

In the last two months of 1998, 44 percent of US households shopped online, spending an estimated $3.14 billion, almost a billion dollars more than had been predicted before Christmas. The findings are based on a survey of 2,300 online households in the US. It was conducted in conjunction with NFO Interactive.

The three most cited reasons for consumer dissatisfaction were lack of merchandise availability, 15 percent. Additional shipping and handling costs, 14 percent. and slow site performance, 13 percent. Jupiter advises merchants that the newer mass market online consumer is far less tolerant of business and technical shortcomings that the early Net shopper.
Portals

Jul 22 1998: Patrick Meehan, research director with Gartner Group has predicted that by the year 2000, Internet portals will be analogous to the major broadcast networks of today.

The use of portals is expected to explode over the coming years and Gartner have identified five clear leaders in the portal market by the year 2000.

According to Meehan, Yahoo! will emerge as the leader. In second and third place will be the new Disney-Infoseek portal and the NBC-Snap portal. In fourth place would be Netscape's Netcenter and in fifth Liberty Media.

Peer-to-Peer Systems

Now the largest contributor in Internet traffic!