

The History of The Internet

The history of the Internet begins at the height of the cold war in the 1960's. People at the Rand Corporation, America's foremost military think tank, were trying to figure out an important strategic problem: how could US authorities talk to each other in the aftermath of a nuclear attack?

Communication networks of the day were chained point-to-point, with each place on the network dependent on the link before it. If one point in the network was blown up, the whole network would become useless.

Paul Baran, one of the Rand thinkers on the project, conceived the idea for a new kind of communications network; one that wasn't organized point-to-point, but instead was set up more like a fishnet. He believed this structure could allow information to find its own path through the network even if a section had been destroyed. His eleven volume report for the Pentagon was eventually shelved; but younger engineers realized that he had hit on an essential idea . . .

Baran's Cold War musings later influenced the design used to create a small, decentralized network connecting computers at four university campuses around the United States. This tiny seed eventually grew into the Internet; a huge network-of-networks, millions of nodes strong, which today covers the entire globe.

The Internet has come a long way from its military beginnings. Touching almost every aspect of society, it is now more likely to be used to plan a family vacation than to transmit military secrets. Following are highlights of the 30 year history of the Internet; how it grew, what technologies grew with it, and the impact of success on the Internet itself.

1962 - 1969

The Internet is first conceived in the early '60s. Under the leadership of the Department of Defense's Advanced Research Project Agency (ARPA), it grows from a paper architecture into a small network (ARPANET) intended to promote the sharing of super-computers amongst researchers in the United States.

1962 - The RAND Corporation begins research into robust, distributed communication networks for military command and control.

1965 - ARPA sponsors research into a "cooperative network of time-sharing computers."

1967 - Delegates at a symposium for the Association for Computing Machinery in Gatlingberg, TN discuss the first plans for the ARPANET.

1969 - Researchers at four US campuses create the first hosts of the ARPANET, connecting Stanford Research Institute, UCLA, UC Santa Barbara, and the University of Utah.

1970 - 1973

The ARPANET is a success from the very beginning. Although originally designed to allow scientists to share data and access remote computers, email quickly becomes the most popular application. The ARPANET becomes a high-speed digital post office as people use it to collaborate on research projects and discuss topics of various interests.

1971 - The ARPANET grows to 23 hosts connecting universities and government research centres around the country.

1972 - The Inter Networking Working Group becomes the first of several standards-setting entities to govern the growing network. Vinton Cerf is elected the first chairman of the INWG, and later becomes known as a "Father of the Internet."

1973 - The ARPANET goes international with connections to University College in London, England and the Royal Radar Establishment in Norway.

1974 - 1981

The general public gets its first vague hint of how networked computers can be used in daily life as the commercial version of the ARPANET goes online. The ARPANET starts to move away from its military/research roots.

1974 - Bolt, Beranek & Newman opens Telenet, the first commercial version of the ARPANET.

1976 - Queen Elizabeth goes online with the first royal email message.

1979 - Tom Truscott and Jim Ellis, two grad students at Duke University, and Steve Bellovin at the University of North Carolina establish the first USENET newsgroups. Users from all over the world join these discussion groups to talk about the net, politics, religion and thousands of other subjects.

1981 - ARPANET has 213 hosts. A new host is added approximately once every 20 days.

1982 - 1987

Bob Kahn and Vint Cerf are key members of a team which creates TCP/IP, the common language of all Internet computers. For the first time the loose collection of networks which made up the ARPANET is seen as an "internet",

and the Internet as we know it today is born. The mid-80s marks a boom in the personal computer and super-minicomputer industries. The combination of inexpensive desktop machines and powerful, network-ready servers allows many companies to join the Internet for the first time. Corporations begin to use the Internet to communicate with each other and with their customers.

1982 - The term "Internet" is used for the first time.

1984 - William Gibson coins the term "cyberspace" in his novel "Neuromancer." The number of Internet hosts exceeds 1,000.

1986 - Case Western Reserve University in Cleveland, Ohio creates the first "Freenet" for the Society for Public Access Computing.

1987 - The number of Internet hosts exceeds 10,000.

1988 - 1990

By 1988 the Internet is an essential tool for communications, however it also begins to create concerns about privacy and security in the digital world. New words, such as "hacker," "cracker" and "electronic break-in", are created. These new worries are dramatically demonstrated on Nov. 1, 1988 when a malicious program called the "Internet Worm" temporarily disables approximately 6,000 of the 60,000 Internet hosts.

1988 - The Computer Emergency Response Team (CERT) is formed to address security concerns raised by the Worm.

1989 - System administrator turned author, Clifford Stoll, catches a group of Cyber spies, and writes the best-seller "The Cuckoo's Egg." The number of Internet hosts exceeds 100,000.

1990 - A happy victim of its own unplanned, unexpected success, the ARPANET is decommissioned, leaving only the vast network-of-networks called the Internet. The number of hosts exceeds 300,000.

1991 - 1993

Corporations wishing to use the Internet face a serious problem: commercial network traffic is banned from the National Science Foundation's NSFNET, the backbone of the Internet. In 1991 the NSF lifts the restriction on commercial use, clearing the way for the age of electronic commerce. At the University of Minnesota, a team led by computer programmer Mark MaCahill releases "gopher," the first point-and-click way of navigating the files of the Internet in 1991. Originally designed to ease campus communications, gopher is freely

distributed on the Internet. MaCahill calls it "the first Internet application my mom can use."

1991 is also the year in which Tim Berners-Lee, working at CERN in Switzerland, posts the first computer code of the World Wide Web in a relatively innocuous newsgroup, "alt.hypertext." The ability to combine words, pictures, and sounds on Web pages excites many computer programmers who see the potential for publishing information on the Internet in a way that can be as easy as using a word processor. Marc Andreessen and a group of student programmers at NCSA (the National Center for Supercomputing Applications located on the campus of University of Illinois at Urbana Champaign) will eventually develop a graphical browser for the World Wide Web called Mosaic.

1991 - Traffic on the NSF backbone network exceeds 1 trillion bytes per month.

1992 - The first audio and video broadcasts take place over a portion of the Internet known as the "MBONE." More than 1,000,000 hosts are part of the Internet.

1993 - Mosaic, the first graphics-based Web browser, becomes available. Traffic on the Internet expands at a 341,634% annual growth rate.

1994 - 1996

As the Internet celebrates its 25th anniversary, the military strategies that influenced its birth become historical footnotes. Approximately 40 million people are connected to the Internet. More than \$1 billion per year changes hands at Internet shopping malls, and Internet related companies like Netscape are the darlings of high-tech investors. The Age of the Internet has arrived.

1994 - The Rolling Stones broadcast the Voodoo Lounge tour over the M-Bone. Marc Andreessen and Jim Clark form Netscape Communications Corp. Pizza Hut accepts orders for a mushroom, pepperoni with extra cheese over the net, and Japan's Prime Minister goes online at www.kantei.go.jp. Backbone traffic exceeds 10 trillion bytes per month.

1995 - NSFNET reverts back to a research project, leaving the Internet in commercial hands. The Web now comprises the bulk of Internet traffic. The Vatican launches www.vatican.va. James Gosling and a team of programmers at Sun Microsystems release an Internet programming language called Java, which radically alters the way applications and information can be retrieved, displayed, and used over the Internet.

1996 - Users in almost 150 countries around the world are now connected to the Internet. The number of computer hosts approaches 10 million.

Within 30 years, the Internet has grown from a Cold War concept for controlling the tattered remains of a post-nuclear society to the Information Superhighway. Just as the railroads of the 19th century enabled the Machine Age, and revolutionized the society of the time, the Internet takes us into the Information Age, and profoundly affects the world in which we live. Today some people telecommute over the Internet, allowing them to choose where to live based on quality of life, not proximity to work. Many cities view the Internet as a solution to their clogged highways and fouled air. Schools use the Internet as a vast electronic library, with untold possibilities. Doctors use the Internet to consult with colleagues half a world away. And even as the Internet offers a single Global Village, it threatens to create a 2nd class citizenship among those without access.

As a new generation grows up as accustomed to communicating through a keyboard as in person, life on the Internet will become an increasingly important part of life on Earth.