

Appendix A

History of Microcomputers

1965

Honeywell corporation introduces the H316 “Kitchen Computer.” This is the first home computer and is offered in the Neiman Marcus catalog for \$10,600.



1970

Ken Thompson and Denis Ritchie create the UNIX operating system at Bell Labs. UNIX will become the dominant operating system for critical applications on servers, workstations, and high-end microcomputers.

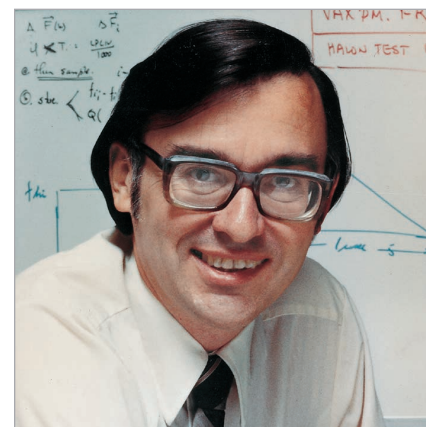


1971

In 1971, Dr. Ted Hoff puts together all the elements of a computer processor on a single silicon chip slightly larger than one square inch. The result of his efforts is the Intel 4004, the world's first commercially available microprocessor. The chip is a four-bit computer containing 2,300 transistors (invented in 1948) that can perform 60,000 instructions per second. Designed for use in a calculator, it sells for \$200. Intel sells more than 100,000 calculators based on the 4004 chip. Almost

overnight, the chip finds thousands of applications, paving the way for today's computer-oriented world, and for the mass production of computer chips now containing millions of transistors.

Steve Wozniak and Bill Fernandez create a computer from chips rejected by local semiconductor companies. The computer is called the Cream Soda Computer because its creators drank Cragmont cream soda during its construction.



1972

Dennis Ritchie and Brian Kernighan create the C programming language at Bell Labs. The UNIX operating system is re-written in C. C becomes one of the most popular programming languages for software development.

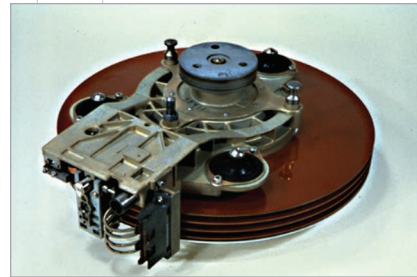
5.25-inch floppy diskettes are introduced, providing a portable way to store and move data from machine to machine.



1973

IBM introduces new mass storage devices: the eight-inch, two-sided floppy disk that can hold 400 KB of data and the Winchester eight-inch, four-platter hard drive that can hold an amazing 70 MB of data.

Bob Metcalfe, working at Xerox PARC, creates a methodology to connect computers called Ethernet.



1974

Intel announces the 8080 chip. This is a 2-MHz, eight-bit microprocessor that can access 64 KB of memory using a two-byte addressing structure. It has over 6000 transistors on one chip. It can perform 640,000 instructions per second.

Motorola introduces the 6800 microprocessor. It is also an eight-bit processor and is used primarily in industrial and automotive devices. It will become the chip of choice for Apple computers sparking a long-running battle between fans of Intel and Motorola chips.



1975

The first commercially available microcomputer, the Altair 880, is the first machine to be called a “personal computer.” It has 64 KB of memory and an open 100-line bus structure. It sells for \$397 in kit form or \$439 assembled. The name “Altair” was suggested by the 12-year-old daughter of the publisher of *Popular Electronics* because Altair was the

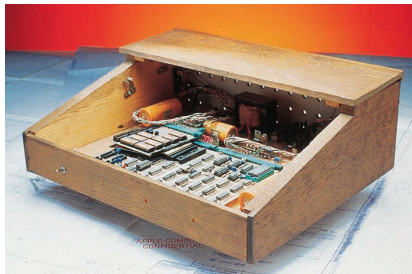
destination that evening for the *Enterprise*, the *Star Trek* space ship.

Two young college students, Paul Allen and Bill Gates, unveil the BASIC language interpreter for the Altair computer. During summer vacation, the pair formed a company called Microsoft, which eventually grows into one of the largest software companies in the world.



1976

Steve Wozniak and Steve Jobs build the Apple I computer. It is less powerful than the Altair, but also less expensive and less complicated. Users must connect their own keyboard and video display, and have the option of mounting the computer’s motherboard in any container they



choose — whether a metal case, a wooden box, or a briefcase. Jobs and Wozniak form the Apple Computer Company together on April Fool’s Day, naming the company after their favorite snack food.

1977



The Apple II computer is unveiled. It comes already assembled in a case, with a built-in keyboard. Users must plug in their own TVs for monitors. Fully assembled microcomputers hit the general market, with Radio Shack, Commodore, and Apple all selling models. Sales are slow because neither businesses nor the gen-

eral public know exactly what to do with these new machines.

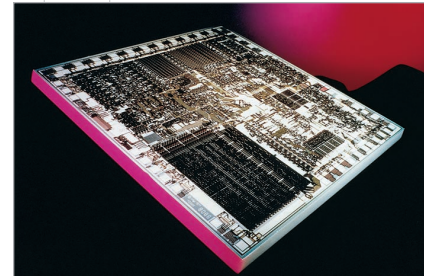
Datapoint Corporation announces Attached Resource Computing Network (ARCnet), the first commercial LAN technology intended for use with microcomputer applications.

1978

Intel releases the 8086 microprocessor, a 16-bit chip that sets a new standard for power, capacity, and speed in microprocessors.

Epson announces the MX-80 dot-matrix printer, coupling high performance with a relatively low price. (Epson from Japan set up operations in the United States in 1975

as Epson America, Inc., becoming one of the first of many foreign companies to contribute to the growth of the PC industry. Up until this point, it has been U.S. companies only. According to Epson, the company gained 60 percent of the dot-matrix printer market with the MX-80.)



1979

Intel introduces the 8088 microprocessor, featuring 16-bit internal architecture and an eight-bit external bus.

Motorola introduces the 68000 chip; it contains 68,000 transistors, hence the name. It will be used in early Macintosh computers.

ABC FASTENERS, INC.		
BALANCE SHEET		
	12/31/74	12/31/75
LIABILITIES		
ACCTS PAYABLE	87000	60000
NOTES PAYABLE 8%	110000	100000
ACCRUALS	10000	10000
PROV. INCOME TAXES	135000	130000
CURR. LIABILITIES	342000	300000
LIST MORT. BONDS 5%	520000	500000
DEBENTURES 6%	200000	200000
COMMON STOCK	600000	600000
RETAINED EARNINGS	300000	400000
NET WORTH	900000	1000000
TOTAL LIABILITIES	2042000	2000000

PRESS SPACE BAR TO CONTINUE

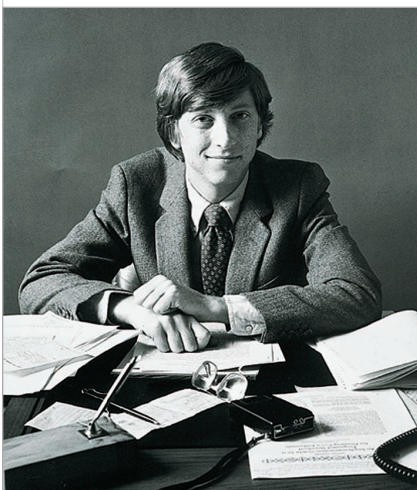
Bob Metcalfe, the developer of Ethernet, forms 3Com Corp. to develop Ethernet-based networking products. Ethernet eventually evolves into the world's most widely used network system.

MicroPro International introduces WordStar, the first commercially successful word processing program for IBM-compatible microcomputers.

Software Arts, Inc., releases VisiCalc, the first commercial spreadsheet program for personal computers. VisiCalc is generally credited as being the program that paved the way for the personal computer in the business world.

successful word processing program for IBM-compatible microcomputers.

1980



IBM chooses Microsoft (co-founded by Bill Gates and Paul Allen) to provide the operating system for its upcoming PC. Microsoft purchases a program developed by Seattle Computer Products called Q-DOS (for Quick and Dirty Operating System), and modifies it to run on IBM hardware.

Bell Laboratories invents the Bellmac-32, the first single-chip microprocessor with 32-bit internal architecture and a 32-bit data bus.

Lotus Development Corporation unveils the Lotus 1-2-3 integrated spreadsheet program, combining spreadsheet, graphics, and database features in one package.



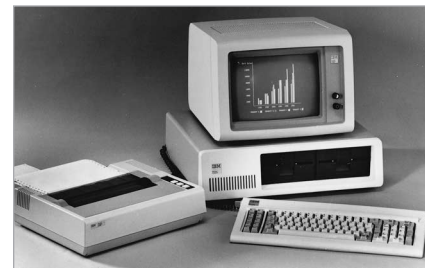
1981

Adam Osborne creates the world's first "portable" computer, the Osborne 1. It weighs about 22 pounds, has two 5.25-inch floppy drives, 64 KB of RAM, and a five-inch monitor but no hard drive. It is based on the z80 processor, runs the CP/M operating system, and sells for \$1,795. The Osborne 1 comes with WordStar (a word processing application) and SuperCalc (a spreadsheet application). It is a huge success.

IBM introduces the IBM-PC, with a 4.77 MHz Intel 8088 CPU, 16 KB of memory, a keyboard, a monitor, one or two 5.25-inch floppy drives, and a price tag of \$2,495.

Hayes Microcomputer Products, Inc., introduces the SmartModem 300, which quickly becomes the industry standard.

Xerox unveils the Xerox Star computer. Its high price eventually dooms the computer to commercial failure, but its features inspire a whole new direction in computer design. Its little box on wheels (the first mouse) can execute commands on screen (the first graphical user interface).



1982

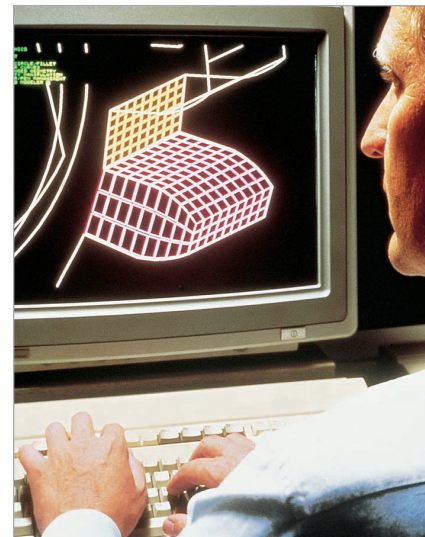
Intel releases the 80286, a 16-bit microprocessor.

Sun Microsystems is formed and the company begins shipping the Sun-1 workstation.

AutoCAD, a program for designing 2-D and 3-D objects, is released. AutoCAD will go on to revolution-

ize the architecture and engineering industries.

Work begins on the development of TCP/IP. The term *Internet* is used for the first time to describe the worldwide network of networks that is emerging from the ARPANET.



1983

Time magazine features the computer as the 1982 “Machine of the Year,” acknowledging the computer’s new role in society.

Apple introduces the Lisa, a computer with a purely graphical operating system and a mouse. The industry is excited, but Lisa’s \$10,000 price tag discourages buyers.

IBM unveils the IBM-PC XT, essentially a PC with a hard disk and more memory. The XT can store programs and data on its built-in 10MB hard disk.



The first version of the C++ programming language is developed, allowing programs to be written in reusable independent pieces, called objects.

The Compaq Portable computer is released, the first successful 100 percent PC-compatible clone. (The term *clone* refers to any PC based on the same architecture as the one used in IBM’s personal computers.) Despite its hefty 28 pounds, it becomes one of the first computers to be lugged through airports.

1984

Adobe Systems releases its PostScript system, allowing printers to produce crisp print in a number of typefaces, as well as elaborate graphic images.

Richard Stallman leaves MIT to start the GNU (GNU’s not Unix) free software project. This project will grow adding thousands of programs to the library of free (open-source, available under a special license), software. This movement is supported by the Free Software Foundation, an alternative to expensive, closed-source software.

Apple introduces the “user-friendly” Macintosh microcom-

puter, which features a graphical interface.

IBM ships the IBM-PC AT, a 6 MHz computer using the Intel 80286 processor, which sets the standard for personal computers running DOS.

IBM introduces its Token Ring networking system. Reliable and redundant, it can send packets at 4 Mbps; several years later it speeds up to 16 Mbps.

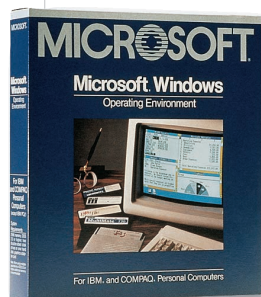
Satellite Software International introduces the WordPerfect word processing program.



1985

Intel releases the 80386 processor (also called the 386), a 32-bit processor that can address more than four billion bytes of memory and performs 10 times faster than the 80286.

Aldus releases PageMaker for the Macintosh, the first desktop publishing software for microcomputers. Coupled with Apple's LaserWriter printer and Adobe's PostScript system, PageMaker ushers in the era of desktop publishing.



Microsoft announces the Windows 1.0 operating environment, featuring the first graphical user interface for PCs mirroring the interface found the previous year on the Macintosh.

Hewlett-Packard introduces the LaserJet laser printer, featuring 300 dpi resolution.

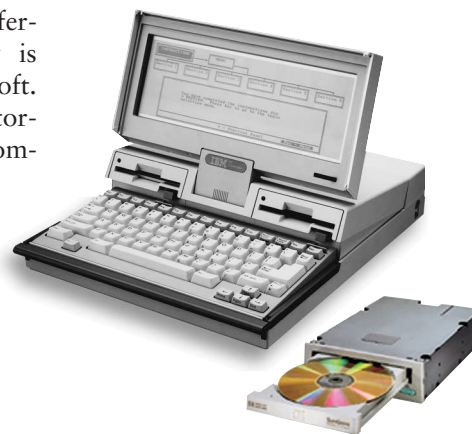


1986

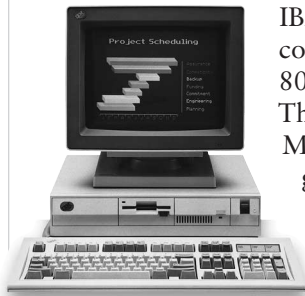
IBM delivers the PC convertible, IBM's first laptop computer and the first Intel-based computer with a 3.5-inch floppy disk drive.

Microsoft sells its first public stock for \$21 per share, raising \$61 million in the initial public offering.

The First International Conference on CD-ROM technology is held in Seattle, hosted by Microsoft. Compact discs are seen as the storage medium of the future for computer users.



1987



IBM unveils the new PS/2 line of computers, featuring a 20-MHz 80386 processor at its top end. This product line includes the MicroChannel bus, but is not a great success because consumers do not want to replace industry standard peripherals. To compete with IBM's MicroChannel architecture, a group of other computer makers introduces the EISA (Extended Industry Standard Architecture) bus.

IBM introduces its Video Graphics Array (VGA) monitor offering 256 colors at 320×200 resolution, and 16 colors at 640×480 .

The Macintosh II computer, aimed at the desktop publishing market, is introduced by Apple Computer. It features an SVGA monitor. Apple Computer introduces HyperCard, a programming language for the Macintosh, which uses the metaphor of a stack of index cards to represent a program—a kind of visual programming language. HyperCard allows linking across different parts of a program or across different programs; this concept will lead to the development of HTML (hypertext markup language).

Motorola unveils its 68030 microprocessor.

Novell introduces its network operating system, called NetWare.



1988

IBM and Microsoft ship OS/2 1.0, the first multitasking desktop operating system. Its high price, a steep learning curve, and incompatibility with existing PCs contribute to its lack of market share.

Apple Computer files the single biggest lawsuit in the computer industry against Microsoft and Hewlett-Packard, claiming copyright infringement of its operating system and graphical user interface.

Hewlett-Packard introduces the first popular ink jet printer, the HP Deskjet.



Steve Jobs' new company, NeXT, Inc., unveils the NeXT computer, featuring a 25-MHz Motorola

68030 processor. The NeXT is the first computer to use object-oriented programming in its operating system and an optical drive rather than a floppy drive.

Apple introduces the Apple CD SC, a CD-ROM storage device allowing access to up to 650 MB of data.

A virus called the "Internet Worm" is released on the Internet, disabling about 10 percent of all Internet host computers.

1989

Intel releases the 80486 chip (also called the 486), the world's first one-million-transistor microprocessor. The 486 integrates a 386 CPU and math coprocessor onto the same chip.

Tim Berners-Lee develops software around the hyper-text concept, enabling users to click on a word or phrase in a document and jump either to another location within the document or to another file. This software provides the foundation for the development of the World Wide Web, and is the basis for the first Web browsers.

The World Wide Web is created at CERN, the European Particle Physics Laboratory in Geneva, Switzerland, for use by scientific researchers.

Microsoft's Word for Windows introduction begins the Microsoft Office suite adoption by millions of users. Previously, Word for DOS had been the second-highest-selling word processing package behind WordPerfect.



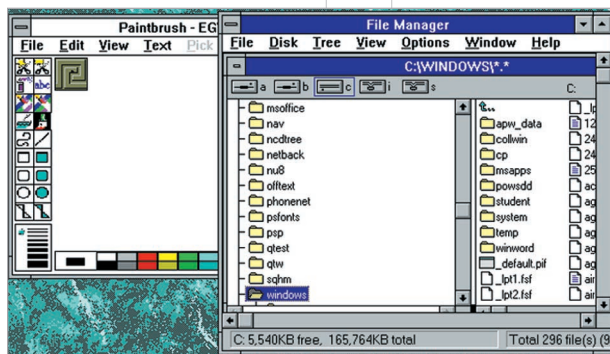
1990

Microsoft releases Windows 3.0, shipping one million copies in four months.

A multimedia PC specification setting the minimum hardware requirements for sound and graphics components of a PC is announced at the Microsoft Multimedia Developers' Conference.

The National Science Foundation Network (NSFNET) replaces ARPANET as the backbone of the Internet.

Motorola announces its 32-bit microprocessor, the 68040, incorporating 1.2 million transistors.



1991

Linus Torvalds releases the source code for Linux 0.01 (a clone of UNIX for the 80386 personal computer) on the Internet. It quickly becomes the base operating system of the open-source movement. Linux



will grow to become one of the most widely used open-source PC operating systems.

Apple Computer launches the PowerBook series of battery-powered portable computers.

Apple, IBM, and Motorola sign a cooperative agreement to design and

produce RISC-based chips, integrate the Mac OS into IBM's enterprise systems, produce a new object-oriented operating system, and develop common multimedia standards. The result is the PowerPC microprocessor.



1992

With an estimated 25 million users, the Internet becomes the world's largest electronic mail network.

In Apple Computer's five-year copyright infringement lawsuit, Judge Vaughn Walker rules in favor of defendants Microsoft and Hewlett-Packard, finding that the graphical user interface in dispute is

not covered under Apple's copyrights.

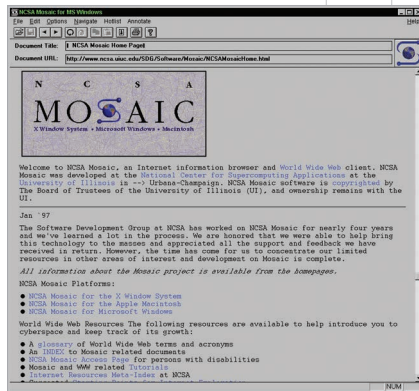
Microsoft ships the Windows 3.1 operating environment, including improved memory management and TrueType fonts.

IBM introduces its ThinkPad laptop computer.



1993

Mosaic, a point-and-click graphical Web browser, is developed at the National Center for Supercomputing Applications (NCSA), making



the Internet accessible to those outside the scientific community.

Intel, mixing elements of its 486 design with new processes, features, and technology, delivers the long-awaited Pentium processor. It offers a 64-bit data path and more than 3.1 million transistors.

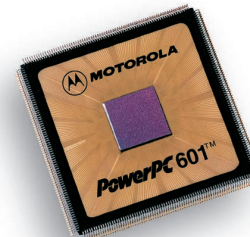
Apple Computer expands its entire product line, adding the Macintosh Color Classic, Macintosh LC III, Macintosh Centris 610 and 650, Macintosh Quadra 800, and the Powerbooks 165c and 180c.

Apple introduces the Newton MessagePad at the Macworld con-

vention, selling 50,000 units in the first 10 weeks.

Microsoft ships the Windows NT operating system.

IBM ships its first RISC-based RS/6000 workstation, featuring the PowerPC 601 chip developed jointly by Motorola, Apple, and IBM.



1994

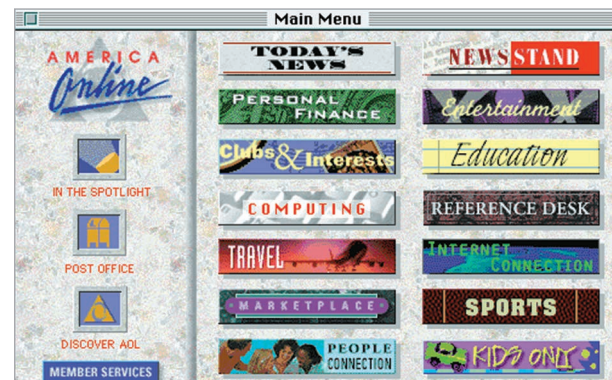
Apple introduces the Power Macintosh line of microcomputers based on the PowerPC chip. This line introduces RISC to the desktop market. RISC was previously available only on high-end workstations.

Netscape Communications releases the Netscape Navigator program, a World Wide Web browser based on the Mosaic standard, but with more advanced features.

Online service providers CompuServe, America Online, and Prodigy add Internet access to their services.

After two million Pentium-based PCs have hit the market, a flaw in the chip's floating-point unit is found by Dr. Thomas Nicely. His report is made public on CompuServe.

Red Hat Linux is introduced and quickly becomes the most commonly used version of Linux.



1995

Intel releases the Pentium Pro microprocessor.

Motorola releases the PowerPC 604 chip, developed jointly with Apple and IBM.

Microsoft releases its Windows 95 operating system with a massive marketing campaign, including prime-time TV commercials. Seven million copies are sold the first month, with sales reaching 26 million by year's end.

Netscape Communications captures more than 80 percent of the World Wide Web browser market, going from a start-up company to a \$2.9 billion company in one year.



A group of developers at Sun Microsystems create the Java development language. Because it enables programmers to develop applications that will run on any platform, Java is seen as the future language of operating systems, applications, and the World Wide Web.

Power Computing ships the first-ever Macintosh clones, the Power 100 series with a PowerPC 601 processor.

eBay, the premier online auction house, is formed.

1996

Intel announces the 200 MHz Pentium processor.

U.S. Robotics releases the PalmPilot, a personal digital assistant that quickly gains enormous popularity because of its rich features and ease of use.



Microsoft adds Internet connection capability to its Windows 95 operating system.

Several vendors introduce Virtual Reality Modeling Language (VRML) authoring tools that provide simple interfaces and drag-and-drop editing features to create three-dimensional worlds with color, texture, video, and sound on the Web.

The U.S. Congress enacts the Communications Decency Act as part of the Telecommunications Act of 1996. The act mandates fines of up to \$100,000 and prison terms for transmission of any "comment, request, suggestion, proposal, image or other communication which is obscene, lewd, lascivious, filthy, or

indecent" over the Internet. The day the law is passed, millions of Web page backgrounds turn black in protest. The law is immediately challenged on constitutional grounds, ultimately deemed unconstitutional, and repealed.

Sun Microsystems introduces the Sun Ultra workstation that includes a 64-bit processor.



1997

Intel announces MMX technology, which increases the multimedia capabilities of a micro-processor. Also, Intel announces the Pentium II microprocessor. It has speeds of up to 333 MHz and introduces a new design in packaging, the Single Edge Contact (SEC) cartridge. It has more than 7.5 million transistors.

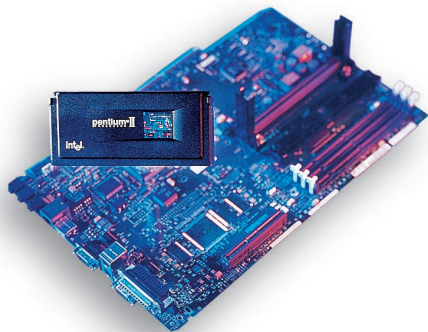
AMD and Cyrix step up efforts to compete with Intel for the \$1000-and-less PC market. Their competing processors are used by PC makers such as Dell, Compaq, Gateway, and even IBM.

The U.S. Justice Department files an antitrust lawsuit against Microsoft, charging the company with anticom-

petitive behavior for forcing PC makers to bundle its Internet Explorer Web browser with Windows 95.

Netscape Communications and Microsoft release new versions of their Web browser. Netscape's Communicator 4 and Microsoft's Internet Explorer 4 provide a full suite of Internet tools, including Web browser, news-reader, HTML editor, conferencing program, and e-mail application.

Digital Video/Versatile Disc (DVD) technology is introduced. Capable of storing computer, audio, and video data, a single DVD disc can hold an entire movie. DVD is seen as the storage technology for the future, ultimately replacing standard CD-ROM technology in PC and home entertainment systems.



1998

Microsoft releases the Windows 98 operating system. Seen mainly as an upgrade to Windows 95, Windows 98 is more reliable and less susceptible to crashes. It also offers improved Internet-related features, including a built-in copy of the Internet Explorer Web browser.

Netscape announces that it will post the source code to the Navigator 5.0 Web browser on the Internet. This is a major step in the open-source software movement.

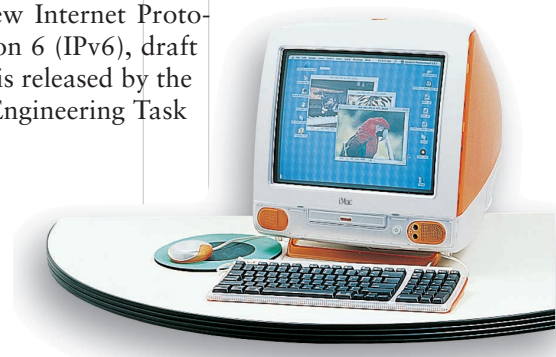
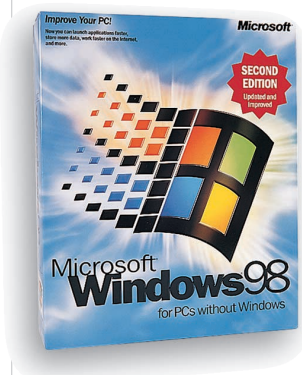
The Department of Justice expands its actions against Microsoft, attempting to block the release of Windows 98 unless Microsoft agrees to remove the Internet Explorer browser from the operating system. Microsoft fights back and a lengthy trial begins in federal court, as the government attempts to prove that Microsoft is trying to hold back competitors such as Netscape.

Intel releases two new versions of its popular Pentium II chip. The Pentium

II Celeron offers slower performance than the standard PII, but is aimed at the \$1,000-and-less PC market, which quickly embraces this chip. At the high end, the Pentium II Xeon is designed for use in high-performance workstations and server systems, and it is priced accordingly. Both chips boost Intel's market share, reaching deeper into more vertical markets.

Apple Computer releases the colorful iMac, an all-in-one system geared to a youthful market. The small, lightweight system features the new G3 processor, which outperforms Pentium II-based PCs in many respects. The iMac uses only USB connections, forcing many users to purchase adapters for system peripherals, and the computer does not include a floppy disk drive.

The new Internet Protocol, version 6 (IPv6), draft standard is released by the Internet Engineering Task Force.



1999

Intel unveils the Pentium III processor, which features 9.5 million transistors. Although the Pentium III's performance is not vastly superior to the Pentium II, it features enhancements that take greater advantage of graphically rich applications and Web sites. A more powerful version of the chip (named Xeon) is also released, for use in higher-end workstations and network server systems.

With its Athlon microprocessor, Advanced Micro Devices finally releases a Pentium-class chip that outperforms the Pentium III processor. The advance is seen as a boon for the lower-price computer market, which relies heavily on chips from Intel's competitors.

Sun Microsystems acquires Star Division Corporation and begins free distribution of StarOffice, a fully featured alternative to Microsoft Office and other proprietary office productivity products.

Apple Computer introduces updated versions of its popular iMac computer, including a laptop version, as well as the new G4 system, with performance rated at one gigaflop, meaning the system can perform more than one billion floating point operations per second.

The world braces for January 1, 2000, as fears of the "Millennium Bug" come to a head. As airlines, government agencies, financial institutions, utilities, and

PC owners scramble to make their systems "Y2K-compliant," some people panic, afraid that basic services will cease operation when the year changes from 1999 to 2000.

Peter Merholz coins the term *blog*, a contraction of Web-log. In early 1999, there are already 50 recognized blog sites on the Web. By 2005 the sites will number in the hundreds of thousands.

The Internet Assigned Number Agency begins assigning Internet Protocol addresses using the new IPv6 addressing structure.



2000

Shortly after the new year, computer experts and government officials around the world announce that no major damage resulted from the “millennium date change,” when computer clocks rolled over from 1999 to 2000. Immediately, a global debate begins to rage: had the entire “Y2K bug” been a hoax created by the computer industry, as a way to reap huge profits from people’s fears? Industry leaders defend their approach to the Y2K issue, stating that years of planning and preventive measures had helped the world avoid a global computer-driven catastrophe that could have brought the planet’s economy to a stand-still.

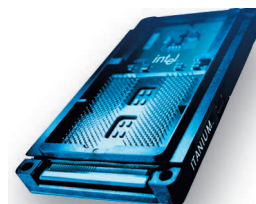
Microsoft introduces Windows 2000 on February 17. It is the biggest commercial software project ever attempted and one of the largest engineering projects of the century, involving 5,345 full-time participants, over half of them engineers. The final product includes almost 30 million lines of code.



On March 6, Advanced Micro Devices (AMD) announces the shipment of a 1GHz version of the Athlon processor, which will be used in PCs manufactured by Compaq and Gateway. It is the first 1GHz processor to be commercially available to the consumer PC market. Within days, Intel Corp. announces the release of a 1GHz version of the Pentium III processor.

In April, U.S. District Judge Thomas Penfield Jackson rules that Microsoft is guilty of taking advantage of its monopoly in operating systems to hurt competitors and leverage better deals with its business partners. Soon after the finding, the Department of Justice recommends that the judge break Microsoft into two separate companies: one focused solely on operating systems, the other focused solely on application development. Microsoft quickly counters by offering to change a number of its business practices. The judge rules to divide the software giant into two companies.

IBM (International Business Machines) announces that it will be selling computers running the Linux operating system. As with other Linux vendors, the IBM version of Linux will be open source.

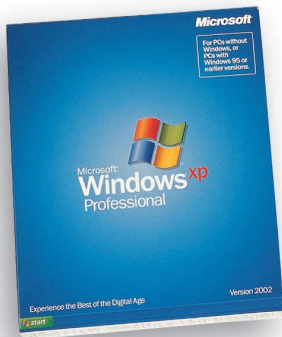


2001

Microsoft releases the Windows XP operating system, with versions for home computers and business desktops. The XP version of Microsoft Office also is unveiled.

After blaming digital music pirates for lost revenue, the Recording Industry Association of America (RIAA) files lawsuits against purveyors of MP3 technology—most notably Napster, an online service that enables users to share MP3-format files freely across the Internet. The suits effectively shut down Napster, but do not stop individuals and other file-sharing services from exchanging music, text, and other files.

Apple introduces OS X, a new operating system for Macintosh computers that is based on BSD (Berkeley Software Distribution) Unix with a beautiful graphical interface. It is an immediate success.



Several versions of recordable DVD discs and drives hit the market. Users instantly adopt the devices to store digitized home movies, data, and software; even though movie pirates soon begin copying and distributing movies on DVD, most users find the large capacity discs a wonderful storage and backup medium.

After several years of explosive growth, the “dot-com” revolution goes in to sudden reverse. As thousands of Web-based companies go out of business (giving rise to the phrase “dot-bomb”), tens of thousands of workers lose their jobs, shareholders suffer billions of dollars in losses, and the world’s financial markets learn a valuable lesson.

Apple introduces the iPod, the premier music player with a 5 GB

internal hard disk that will store 1,000 CD-quality songs.

Technology takes an important new role in society after the United States is attacked by terrorists on September 11, 2001. Government agencies, the military, and airlines place a new emphasis on security, recruiting new high-tech methods to monitor travelers and inspect people and baggage for dangerous items. Almost immediately, billions of dollars are invested in the development of new bomb-detection technologies and the creation of a huge, multinational database that can allow airlines to track the movements of passengers through the flight system.

Europe and Asia adopt the new Internet Protocol standard IPv6, the United States has not yet moved to adopt the new standard.



2002



Because of the high cost of flying and concerns about security, many American businesses drastically reduce business travel. Increasingly, companies rely on technologies such as video-conferencing, teleconferencing, and online document sharing to work with partners and customers.

After a year of devastating shake-outs, the dot-com world begins to pick itself up again. The new breed of online entrepreneur bases compa-

nies on sound business practices, rather than the glamour of simply being “new economy.” Investments in new online ventures slow to a trickle, enabling only those companies with the best ideas and real promise of profits to flourish.

The wireless networking boom continues with an emphasis on enabling handheld computers and telephones to access the Internet via wireless connections. Products such as digital two-way pagers, wireless phones, and combination telephone/PDAs sell at unprecedented levels.

Michael Robertson releases Lin-dows, a Linux-based operating system that has a full graphical user interface and comes with Open Office software. Wal-Mart and Fry’s, two large retail chains, market Lin-dows-based computer systems for as

little as \$199. Microsoft immediately sues Robertson to try to prevent the product from reaching the market but loses.

XML (eXtensible Markup Language) and Web-based applications take center stage in many businesses.

Microsoft releases Windows XP Server Edition and the .NET Framework.

OpenOffice.org announces the release of OpenOffice.org 1.0, a free, full-featured suite of productivity applications compatible with the file formats used by Microsoft Office and many other office suites. An open-source alternative to expensive application suites, OpenOffice.org runs under Windows, Solaris, Linux, the Mac OS, and other operating systems.



2003

The National Center for Supercomputing Applications announces that Mike Showerman and Craig Steffen created a supercomputer based on 70 Sony PlayStation 2 gaming systems. The supercomputer cost about \$50,000 to build, uses the Linux operating system and a Hewlett-Packard high-speed switch, and can perform 6.5 billion mathematical operations per second.

The Slammer worm does over \$1 billion in damage and demonstrates that no network is truly secure.

Lindows explodes across the globe with several countries opting for this powerful and inexpensive alternative to high-priced proprietary software.

Microsoft releases Office 2003, the latest in the Office suite series.

Intel and AMD release 64-bit processors targeted for the home computer market.

Apple introduces the Power Macintosh G5, a 64-bit processor.

In a continuing attempt to control file sharing, the Recording Industry Association of America begins suing individuals who share files.

Apple opens an online music store, iTunes, offering more than 200,000 titles at \$0.99 each.

Wi-Fi (Wireless Fidelity) or 802.11b/g comes to the consumer market with hot spots springing up both in home networking and in some commercial locations such as Starbucks. With this new technology comes the new technique called “war driving,” where individuals drive around in automobiles with laptop computers looking for wireless networks that will allow them access.



2004

Spam (unsolicited e-mail) and malware (programs such as viruses, Trojan Horses, and worms) cause major problems across the Internet. Crackers use viruses to generate spam and attack companies. One example is Mydoom, which takes control of more than 250,000 personal computers and uses them to attack the SCO Group Inc. Web site. Some estimates made in mid-2004 show that nearly 85 percent of all e-mail messages can be classified as spam.

By March, Apple's iTunes store has sold 50 millions songs.

Centralized computing makes a resurgence in both home and business environments with mainframe-like servers feeding "stateless devices" formerly known as dumb terminals.

RFID (Radio Frequency Identification) tags, common on some products, are seen as an invasion of privacy when shoppers are scanned to see what brands they buy.

2005

The last of the old Internet Protocol addresses (IPv4) is assigned and now all Net devices worldwide must support the new standard, IPv6.

Microsoft releases the next version of Windows, code named Longhorn.

"Disposable computers" move into home computing. People no longer try to repair a broken personal computer; they simply throw away the old one and buy a new one

that is quickly updated to contain everything on the old machine.

Bluetooth-enabled devices allow sharing of files, text, data, images, and music across a wide range of personal devices, allowing you to play tunes from your iPod on your cell phone or as background on your PDA.

