

Mosaic (web browser)

NCSA Mosaic, or simply **Mosaic**, is the web browser that popularized the World Wide Web and the Internet. It was also a client for earlier internet protocols such as File Transfer Protocol, Network News Transfer Protocol, and Gopher. The browser was named for its support of multiple internet protocols.^[3] Its intuitive interface, reliability, Microsoft Windows port, and simple installation all contributed to its popularity within the web, as well as on Microsoft operating systems.^[4] Mosaic was also the first browser to display images inline with text instead of displaying them in a separate window.^[5] It is often described as the first graphical web browser, though it was preceded by WorldWideWeb, the lesser-known Erwise,^[6] and ViolaWWW.

Mosaic was developed at the National Center for Supercomputing Applications (NCSA)^[5] at the University of Illinois at Urbana–Champaign beginning in late 1992. NCSA released it in 1993,^[7] and officially discontinued development and support on January 7, 1997.^[8]

Starting in 1995, Mosaic lost market share to Netscape Navigator and only had a tiny fraction of users left by 1997, when the project was discontinued. Microsoft licensed Mosaic to create Internet Explorer in 1995.

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NCSA Mosaic



NCSA Mosaic 3.0 for Microsoft Windows

Developer(s)	NCSA
Initial release	0.5 / January 23, 1993 ^[1]
Final release	3.0 / January 7, 1997
Written in	C ^[2]
Platform	AmigaOS <div>Classic Mac OS</div> <div>Unix</div> <div>OpenVMS</div> <div>Microsoft Windows</div>
Available in	English
Type	Web browser
License	Proprietary
Website	www.ncsa.illinois.edu/enabling/mosaic (http://www.ncsa.illinois.edu/enabling/mosaic)

History



Mosaic 1.0 running under System 7.1, displaying the Mosaic Communications Corporation (later Netscape) website.

After trying ViolaWWW, David Thompson demonstrated it to the NCSA software design group.^[9] This inspired Marc Andreessen and Eric Bina - two programmers working at NCSA - to create Mosaic. Andreessen and Bina originally designed and programmed NCSA Mosaic for Unix's X Window System called *xmosaic*.^{[5][7][9][10]} Then, in December 1991, the Gore Bill created and introduced by then Senator and future Vice President Al Gore was passed, which provided the funding for the Mosaic project. Development began in December 1992. Marc Andreessen announced the project on January 23, 1993.^[11] The first alpha release (numbered 0.1a) was published in June 1993, and the first beta release (numbered 0.6b) followed quickly thereafter in September 1993. Ports to Microsoft Windows and Macintosh had been released in September.^[9] A port of Mosaic to

the Commodore Amiga was available by October 1993. NCSA Mosaic for Unix (X-Windows) version 2.0 was released on November 10, 1993.^[12] Version 1.0 for Microsoft Windows was released on November 11, 1993.^{[13][14]} From 1994 to 1997, the National Science Foundation supported the further development of Mosaic.^[15]

Marc Andreessen, the leader of the team that developed Mosaic, left NCSA and, with James H. Clark, one of the founders of Silicon Graphics, Inc. (SGI), and four other former students and staff of the University of Illinois, started Mosaic Communications Corporation. Mosaic Communications eventually became Netscape Communications Corporation, producing Netscape Navigator. Mosaic's popularity as a separate browser began to lessen upon the release of Andreessen's Netscape Navigator in 1994. This was noted at the time in *The HTML Sourcebook: The Complete Guide to HTML*: "Netscape Communications has designed an all-new WWW browser Netscape, that has significant enhancements over the original Mosaic program."^{[16]:332}

1994 saw the first commercial product to incorporate Mosaic: SCO Global Access, a modified version of its Open Desktop version of Unix that served as an Internet gateway.^[17]

By 1998 its user base had almost completely evaporated, being replaced by other web browsers.

Licensing

The licensing terms for NCSA Mosaic were generous for a proprietary software program. In general, non-commercial use was free of charge for all versions (with certain limitations). Additionally, the X Window System/Unix version publicly provided source code (source code for the other versions was available after agreements were signed). Despite persistent rumors to the contrary, however, Mosaic was never released as open source software during its brief reign as a major browser; there were always constraints on permissible uses without payment.

As of 1993, license holders included these:^[18]

- Amdahl Corporation
- Fujitsu Limited (Product: Infomosaic, a Japanese version of Mosaic. Price: Yen5,000 (approx US\$50))

- Infoseek Corporation (Product: No commercial Mosaic. May use Mosaic as part of a commercial database effort)
- Quadraley Corporation (Consumer version of Mosaic. Also using Mosaic in its online help and information product, GWHIS. Price: US\$249)
- Quarterdeck Office Systems Inc.
- The Santa Cruz Operation Inc. (Product: Incorporating Mosaic into "SCO Global Access," a communications package for Unix machines that works with SCO's Open Server. Runs a graphical e-mail service and accesses newsgroups.)
- SPRY Inc. (Products: A communication suite: Air Mail, Air News, Air Mosaic, etc. Also producing Internet In a Box with O'Reilly & Associates. Price: US\$149–\$399 for Air Series.)
- Spyglass, Inc. (Product: Relicensing to other vendors. Signed deal with Digital Equipment Corp., which would ship Mosaic with all its machines.)

Features

Robert Reid notes that Andreessen's team hoped:

... to rectify many of the shortcomings of the very primitive prototypes then floating around the Internet. Most significantly, their work transformed the appeal of the Web from niche uses in the technical area to mass-market appeal. In particular, these University of Illinois students made two key changes to the Web browser, which hyper-boosted its appeal: they added graphics to what was otherwise boring text-based software, and, most importantly, they ported the software from so-called Unix computers that are popular only in technical and academic circles, to the [Microsoft] Windows operating system, which is used on more than 80 percent of the computers in the world, especially personal and commercial computers.^{[19]:xxv}

Mosaic is based on the libwww library^{[20][21][22]} and thus supported a wide variety of Internet protocols included in the library: Archie, FTP, gopher, HTTP, NNTP, telnet, WAIS.^[7]

Mosaic is not the first web browser for Microsoft Windows; this is Thomas R. Bruce's little-known Cello. The Unix version of Mosaic was already famous before the Microsoft Windows, Amiga, and Mac versions were released. Other than displaying images embedded in the text (rather than in a separate window), Mosaic's original feature set is similar to the browsers on which it was modeled, such as ViolaWWW.^[5] But Mosaic was the first browser written and supported by a team of full-time programmers, was reliable and easy enough for novices to install, and the inline graphics reportedly proved immensely appealing. Mosaic is said to have made the Web accessible to the ordinary person for the first time and already had 53% market share in 1995.^[23]

Impact of Mosaic

Mosaic was the web browser that led to the Internet boom of the 1990s^{[19]:xlii}. Other browsers existed during this period, notably Erwise, ViolaWWW, MidasWWW and tkWWW, but did not have the same effect as Mosaic on public use of the Internet.^[24]

In the October 1994 issue of *Wired* magazine, Gary Wolfe notes in the article titled "The (Second Phase of the) Revolution Has Begun: Don't look now, but Prodigy, AOL, and CompuServe are all suddenly obsolete – and Mosaic is well on its way to becoming the world's standard interface":

When it comes to smashing a paradigm, pleasure is not the most important thing. It is the only thing. If this sounds wrong, consider Mosaic. Mosaic is the celebrated graphical "browser" that allows users to travel through the world of electronic information using a point-and-click interface. Mosaic's charming appearance encourages users to load their own documents onto the Net, including color photos, sound bites, video clips, and hypertext "links" to other documents. By following the links - click, and the linked document appears - you can travel through the online world along paths of whim and intuition. Mosaic is not the most direct way to find online information. Nor is it the most powerful. It is merely the most pleasurable way, and in the 18 months since it was released, Mosaic has incited a rush of excitement and commercial energy unprecedented in the history of the Net.^[18]

Reid also refers to Matthew K. Gray's website, Internet Statistics: Growth and Usage of the Web and the Internet (<https://www.mit.edu/~mkgray/net/>), which indicates a dramatic leap in web use around the time of Mosaic's introduction.^{[19]:xxv}

In addition, David Hudson concurs with Reid, noting that:

Marc Andreessen's realization of Mosaic, based on the work of Berners-Lee and the hypertext theorists before him, is generally recognized as the beginning of the web as it is now known. Mosaic, the first web browser to win over the Net masses, was released in 1993 and made freely accessible to the public. The adjective phenomenal, so often overused in this industry, is genuinely applicable to the... 'explosion' in the growth of the web after Mosaic appeared on the scene. Starting with next to nothing, the rates of the web growth (quoted in the press) hovering around tens of thousands of percent over ridiculously short periods of time were no real surprise.^{[25]:42}

Ultimately, web browsers such as Mosaic became the *killer applications* of the 1990s. Web browsers were the first to bring a graphical interface to search tools the Internet's burgeoning wealth of distributed information services. A mid-1994 guide lists Mosaic alongside the traditional, text-oriented information search tools of the time, Archie and Veronica, Gopher, and WAIS^[26] but Mosaic quickly subsumed and displaced them all. Joseph Hardin, the director of the NCSA group within which Mosaic was developed, said downloads were up to 50,000 a month in mid-1994.^[27]

In November 1992, there were twenty-six websites in the world^[28] and each one attracted attention. In its release year of 1993, Mosaic had a What's New page, and about one new link was being added per day. This was a time when access to the Internet was expanding rapidly outside its previous domain of academia and large industrial research institutions. Yet it was the availability of Mosaic and Mosaic-derived graphical browsers themselves that drove the explosive growth of the Web to over 10,000 sites by August 1995 and millions by 1998.^[29] Metcalfe expressed the pivotal role of Mosaic this way:

In the Web's first generation, Tim Berners-Lee launched the Uniform Resource Locator (URL), Hypertext Transfer Protocol (HTTP), and HTML standards with prototype Unix-based servers and browsers. A few people noticed that the Web might be better than Gopher.

In the second generation, Marc Andreessen and Eric Bina developed NCSA Mosaic at the University of Illinois. Several million then suddenly noticed that the Web might be better than sex.

In the third generation, Andreessen and Bina left NCSA to found Netscape...

— Bob Metcalfe^{[30][31]}

Branches and descendants

Netscape Navigator was later developed by Netscape, which employed many of the original Mosaic authors; however, it intentionally shared no code with Mosaic. Netscape Navigator's code descendant is Mozilla Firefox.^[32]

Spyglass, Inc. licensed the technology and trademarks from NCSA for producing their own web browser but never used any of the NCSA Mosaic source code.^[33] Microsoft licensed Spyglass Mosaic in 1995 for US\$2 million, modified it, and renamed it Internet Explorer.^[34] After a later auditing dispute, Microsoft paid Spyglass \$8 million.^{[34][35]} The 1995 user guide *The HTML Sourcebook: The Complete Guide to HTML*, specifically states, in a section called *Coming Attractions*, that Internet Explorer "will be based on the Mosaic program".^{[16]:331} Versions of Internet Explorer before version 7 stated "Based on NCSA Mosaic" in the About box. Internet Explorer 7 was audited by Microsoft to ensure that it contained no Mosaic code,^[36] and thus no longer credits Spyglass or Mosaic.

After NCSA stopped work on Mosaic, development of the NCSA Mosaic for the X Window System source code was continued by several independent groups. These independent development efforts include mMosaic (multicast Mosaic)^[37] which ceased development in early 2004, and Mosaic-CK and VMS Mosaic.

VMS Mosaic, a version specifically targeting OpenVMS operating system, was one of the longest-lived efforts to maintain Mosaic. Using the VMS support already built-in in original version (Bjorn S. Nilsson ported Mosaic 1.2 to VMS in the summer of 1993),^[38] developers incorporated a substantial part of the HTML engine from mMosaic, another defunct flavor of the browser.^[39] the last (4.2) release, VMS Mosaic supported HTML 4.0, OpenSSL, cookies, and various image formats including GIF, JPEG, PNG, BMP, TGA, TIFF and JPEG 2000 image formats.^[40] The browser works on VAX, Alpha, and Itanium platforms.^[41]

Another long-lived version of Mosaic – **Mosaic-CK**, developed by Cameron Kaiser – saw its last release (version 2.7ck9) on July 11, 2010; a maintenance release with minor compatibility fixes (version 2.7ck10) was released on January 9, 2015, followed by another one (2.7ck11) in October 2015.^[42] The stated goal of the project is "Lynx with graphics" and runs on Mac OS X, Power MachTen, Linux and other compatible Unix-like OSs.^[42]

See also

- Comparison of web browsers
- History of the World Wide Web
- List of web browsers

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