

Chromium (web browser)

Chromium is a free and open-source software project from Google. The source code can be compiled into a web browser.

Google uses the code to make its Chrome browser, which has more features than Chromium. Many other browsers are also based on the Chromium code, including Microsoft Edge, Opera, and Amazon Silk. In addition, some parties (although not Google) build the code as-is and release browsers with the Chromium name.

Chromium's user interface is minimalist. Google sought to make the browser "feel lightweight (cognitively and physically) and fast."^[6]

Contents

Licensing

Differences from Google Chrome

Features

Branding and licensing

History

Version numbers

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

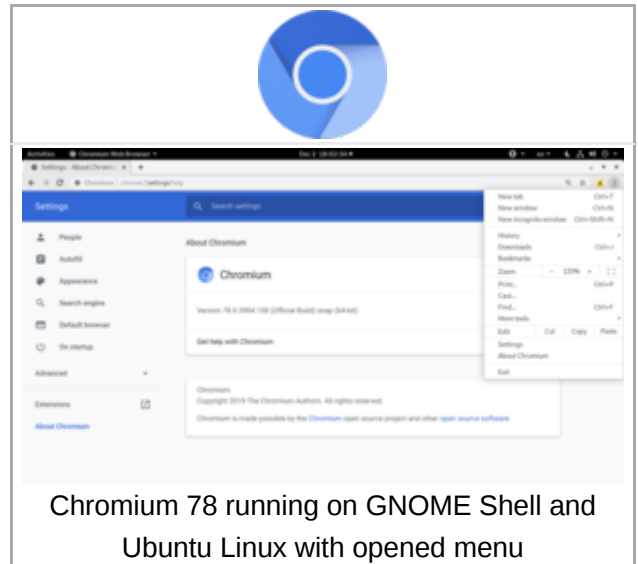
Snapshots

Browsers based on Chromium

Active

Discontinued

Chromium



Chromium 78 running on GNOME Shell and Ubuntu Linux with opened menu

Developer(s)	Google
Initial release	September 2, 2008
Repository	chromium.googlesource.com/chromium/src (https://chromium.googlesource.com/chromium/src)
Written in	C, C++, JavaScript ^{[1][2]}
Engines	Blink, V8
Operating system	Windows 7 or later ^[3] Android KitKat (4.4) or later OS X Yosemite (10.10) or later Linux ^[4]
Platform	IA-32, x86-64, ARM
Type	Web browser
License	BSD MIT LGPL MS-PL MPL+GPL+LGPL tri-licensed ^[5]

See also
References
External links

Website	www.chromium.org/Home (https://www.chromium.org/Home)
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Licensing

Chromium is an entirely free and open-source software project. The Google-authored portion is released under the BSD license.^[7] Other parts are subject to a variety of licenses, including MIT, LGPL, Ms-PL, and an MPL/GPL/LGPL tri-license.^[8]

Differences from Google Chrome

Chromium provides the vast majority of source code for Google Chrome, including the user interface, the Blink rendering engine, and the V8 JavaScript engine. Thus Google chose the "Chromium" name as an analogy of chromium metal forged into chrome plating.^[9]

Features

Chrome has more features than Chromium. The following list of Chrome features are not present in a default Chromium build. However, some can be enabled or manually added to a Chromium build, which is what many Linux distributions do.^[10]

- Auto-update capability
- Integrated Adobe Flash Player
- API keys for some Google services
- The Widevine digital rights management module
- Licensed codecs for the popular H.264 video and AAC audio formats
- Tracking mechanisms for usage and crash reports

Branding and licensing

While Chrome has the same user interface functionality as Chromium, it changes the color scheme to the Google-branded one. Unlike Chromium, Chrome is not open-source, so its binaries are licensed as freeware under the *Google Chrome Terms of Service*.^[11]

History

Version numbers

Releases are identified by a four-part version number, e.g. 47.0.2491.0 (Chromium 47 initial release 23 August 2015).^[12] The components are major.minor.build.patch.^[13]

Major.minor reflects scheduling policy
Build.patch identifies content progression

A *Major.minor* branch point schedule is published.^[13] Branch points occur roughly every six to seven weeks.^[14] The published dates are a last branch date of each Chromium (*Major*) release and are tied to the Google Chrome development cycle. They lag the initial Chromium release by about 40 days and precede the next by about 2. Details are described in Chrome Release cycles.

2008

Google Chrome was introduced in September 2008, and along with its release, the Chromium source code was also made available, allowing builds to be constructed from it. The initial code release included builds for Windows and macOS, and a build for Linux, at a very early stage of development and lacking complete functionality. Chromium 1.0 was released in December 2008 and with it Chrome was removed from beta status for Windows only.^{[15][16]}



An early alpha build of Chromium 3.0 for Linux, which clarifies its separation from Google Chrome

Upon its first release in September 2008 Chromium was criticized for storing saved passwords in a manner so that any casual user of a computer can easily read them from the GUI. Chromium users have filed many bug reports and feature requests asking for a master password option to access stored passwords, but Chromium developers have consistently insisted that this provides no real security against knowledgeable hackers. Users have argued that it would protect against co-workers or family members borrowing a computer and seeing the stored passwords in clear text. In December 2009, Chromium developer P. Kasting stated: "A master password was issue 1397. That issue is closed. We will not implement a master password. Not now, not ever. Arguing for it won't make it happen. 'A bunch of people would like it' won't make it happen. Our design decisions are not democratic. You cannot always have what you want."^{[17][18]}

2009

In January 2009 the first development versions of Chromium 2.0 were made available, featuring a bookmark manager and support for non-standard CSS features, including gradients, reflections and masks.^[19]

In May 2009 the first alpha Linux version of Chromium was made available. In reviewing that alpha version Ryan Paul said that it was "still missing features and [has] lots of rendering bugs, but it is clearly moving in the right direction." The first developer releases for Chrome on the Linux and macOS platforms were made available in June 2009, although they were in a very early stage and lacked Adobe Flash, privacy settings, the ability to set the default search provider and even printing at that point. In July 2009 Chromium incorporated native theming for Linux, using the GTK+ toolkit to allow it fit into the GNOME desktop environment.^{[20][21][22][23]}

Chromium 3.0 was released on 28 May 2009 as version 3.0.182.2.^{[24][25]} Chrome 3.0 followed in September 2009 and introduced a much faster JavaScript engine, a system for user-selectable themes, improvements to the Omnibox and a redesigned *new tab* display page.^[26]

Chromium 4.0.212.0 was the first Chromium 4.0 version and appeared on 22 September 2009^{[24][27]} with Chrome 4.0 publicly released in December 2009. Both brought support for extensions, plus synchronization of bookmarks along with Chrome beta versions for macOS and Linux. The all-platform market penetration of Chrome/Chromium 4.0 combined was at 6.73% by the end of April 2010.^{[28][29][30][31]}

Gentoo Linux has had Chromium in the official repository since September 2009.^[32] FreeBSD has had Chromium available since late 2009 and a port has been available from the FreeBSD ports system since late 2010.^{[33][34]} OpenBSD has had Chromium available for i386 and amd64 platforms since late 2009.^[35] Although OpenBSD supports many browsers,^[36] recent releases only officially highlight Chromium and Firefox.^[37]

2010

Chromium 5.0 was released on 26 January 2010 with 5.0.306.0 as the initial version.^{[24][38]} Google Chrome 5.0 followed on 25 May 2010 and provided stable (non-beta) releases for all platforms. At that time the web magazine, *OMG! Ubuntu!*, reported that Chrome/Chromium usage was at 36.53% for Linux browsers, compared to 55.52% for Firefox and 2.82% for Opera.^{[29][39][40][41]}



Original Chromium logo used from the project's inception until Chromium 11

Lubuntu used Chromium as the default browser since its first release, Lubuntu 10.04 in April 2010, until Lubuntu 13.10 in October 2013 when it moved to Firefox instead.^[42] Ubuntu started offering Chromium through the Ubuntu Software Center starting with Ubuntu 10.04 LTS as part of the "universe" repository. The initial version available in April 2010 was 5.0.342.9, with brand-new versions delivered as updates.^[43] Puppy Linux has had Chromium available starting with Chromium 5.0.342 on Lucid Puppy 5.0.0, based on the Ubuntu application repository.^[44] Maemo, Nokia's former mobile operating system, offered a proof-of-concept version of Chromium with an unmodified user interface which was released on 11 April 2010.^[45]

Chromium 6.0 was introduced in May 2010 with the first release version 6.0.397.0. In July 2010 Chromium 6 daily builds introduced new features focusing on user interface minimalism, including a unified single page and tools menu, no home button by default (although user configurable), no "go button", a combined "reload/stop" button, bookmark bar deactivated by default, an integrated PDF reader, WebM and VP8 support for use with HTML5 video, and a smarter URL bar.^{[24][46][47]} Chrome 6 was released in both a stable and beta version on 2 September 2010 as version 6.0.472.53. The switch to 6.0 brought security fixes, a slightly updated user interface, improvements to form autofilling, synchronizing of both extensions and autofill data, along with increased speed and stability.^[48]

Chromium 7.0 was released on 17 August 2010, with 7.0.497.0 as the first version made available. This version boosted HTML5 performance to double the speed of Chromium 6. It also added hardware acceleration, which speeds up the browser in complex graphics situations by a factor of 225 times, integration of instant search, UI Tabs to move all the remaining user interface windows into the browser tabs, including the "options" menu, and has 3% faster JavaScript performance.^{[24][49][50][51]}

7 October 2010 marked the release of Chromium 8.0, seven and a half weeks after that of Chromium 7. The initial release in this series was version 8.0.549.0. The development of Chromium 8.0 focused on improved integration into Chrome OS and improved cloud features. These include background web applications, host remoting (allowing users centrally to control features and settings on other computers)

and cloud printing.^{[24][51]} On 12 January 2011 versions of Chrome and Chromium prior to version 8.0.552.237 were identified by US-CERT as "contain[ing] multiple memory corruption vulnerabilities. These vulnerabilities include a stack corruption vulnerability in the PDF renderer component, two memory corruption vulnerabilities in the Vorbis decoder and a video frame size error resulting in a bad memory access ... By convincing a user to view a specially crafted HTML document, PDF file, or video file, an attacker can cause the application to crash or possibly execute arbitrary code." This vulnerability was publicized after Chrome version 8.0.552.237 was released fixing these problems, to alert users to upgrade versions as soon as possible.^[52]



Acid3 test results on Chromium 7

Chromium 9.0 was released on 23 October 2010, just 16 days after Chromium 8.0, with 9.0.562.0 as the initial version. The new version introduced an infobar refresh feature with the aim of preventing website spoofing attacks. Reviewer Wolfgang Gruener noted that the first builds of Chrome 9 have now doubled in size between Chrome 3 and Chrome 9 to a compressed download of 28.2 MB, calling it "notably more bloated". Gruener also criticized the seemingly arbitrary numbering breaks between major versions, saying, "even by more progressive standards, the version numbering may be a bit excessive. By the end of this year, Google will have gone through seven or eight different browser versions. Some may doubt the benefit of that strategy."^{[24][53]} Chromium 9 introduced two new test features in November 2010 intended to load web pages more quickly, "pre-rendering" and "false start", plus sandboxing for Adobe Flash. Stable releases of Chrome and Chromium were version 9.0.597.84 and included features such as *Instant Search* which allows the URL bar to act through Google Instant when Google is the default search. Other features included GPU/hardware acceleration, default 3D graphics through WebGL and access to the Chrome Web Store on the New Tab page.^{[54][55][56]}

Chromium 10.0 was released on 3 December 2010, with 10.0.601.0 as the initial version. It introduced 18 new features, including "Instant Type" searching and "GPU accelerated compositing". Development of "Webpage pre-rendering" was reduced to an inactive feature while a selectable "snap start" was introduced.^{[24][57]}

2011

Chromium 11.0 was released on 28 January 2011, with 11.0.652.0 as the initial version. Development work in this version centered on cleaning up the *settings* menu, including the Sync menu and eliminating all checkboxes. Reviewer Wolfgang Gruener said "The Settings menu isn't quite as messy anymore and looks much more like what you would expect from a professionally designed software." Language and spell checking support was expanded to 100 languages. Chromium 11 used WebKit 534.18 and V8 3.1.1 which resulted in improved speed in JavaScript and other benchmark tests. In early testing Chromium 11 was faster than Firefox 4 in V8 and Kraken benchmarks, but was 12% slower than Internet Explorer 9 in Sunspider tests.^{[24][56]}



Logo introduced with Chromium 11

In February 2011, Google's Jeff Chang announced to Chromium developers that Google was considering further large-scale interface changes. Under consideration were eliminating the "Omnibox" URL bar and combining the two-line layout which has tabs on one line and navigation buttons, a menu and URL bar

on a second line into one single line, thus freeing up more screen space for content. (Such a layout was later adopted by Internet Explorer 9.) Chang acknowledged that this would result in URLs not always being visible to the user, that navigation controls and menus may lose their context and that the resulting single line could be quite crowded. Other proposed changes include being able to log into multiple accounts in different windows and improved URL suggestions from the user's history.^[58] By the middle of 2011, after some experimentation, the developers decided that eliminating the URL bar was too risky and shelved the idea.^[59] Chromium 11 also introduced a new simplified 2D logo that replaced the 3D logo used from the project since its inception.^[60]

Mageia first offered Chromium 11 in Mageia v1 during 2011.^{[61][62]}

Chromium 12.0 was released on 11 March 2011, with 12.0.700.0 as the first version. Initial changes in the first versions of Chromium 12 included `about:flags` updates of test features, incorporating an fps counter for hardware acceleration benchmarks, a P2P API that may indicate future platform data exchange features, an enhanced URL bar and small changes to the tabs. Chromium 12 incorporated WebKit 534.24 and V8 JavaScript engine version 3.2.1.1. It is anticipated that a URL bar web app launcher would be added during the development cycle. Early in the Chromium 12 cycle the *history quick provider* was introduced. This feature automatically searches the browser history for websites visited in the past 72 hours looking for matching page titles and URLs. It also searches through URLs that have been typed at least twice and URLs that have been visited at least four times ever.^{[24][63]}

In March 2011 Google announced directions for the project for the year, including a plan for seven new major versions, planning to end the year with Chrome 17 out. Development priorities focus on reducing the browser's size, integrating web applications and plug-ins, cloud capabilities and touch interface. The size is a concern to developers, who have noted that Chrome 1 was 9.0 MB in Windows download size, compared to Chrome 10 for Windows at 26.2 MB, as a result they have created a "bloat taskforce". Larger download sizes are a problem for a number of reasons, as Chrome Developer Ian Fette explained: "1. We do distribution deals with Chrome, where we bundle Chrome with other products. These get difficult when our binary grows. 2. We see increased download failures/ install dropoffs as the binary grows, especially in countries with poor bandwidth like India. India also happens to be a very good market for Chrome (we have good market share there and growing), so that's also very problematic."^{[64][65]}

With the release of Chromium 12.0.742.0 on 19 April 2011 the interface incorporated many changes, the most significant since Chromium 6 was released. A multi-profile button was introduced allowing users to log into multiple Google and other accounts in the same browser instance. The new tab page was also redesigned and separated into four horizontally scrollable screens, providing access to *most visited pages*, *Google apps*, plus two identified pages. The page reload button was also redesigned along with minor changes to the URL bar. The first stable version of Chrome and Chromium 12 released was 12.0.742.91 which brought malware detection and support for hardware-accelerated 3D CSS transforms.^{[66][67]}

Chromium 13.0 was released on 26 April 2011, with 13.0.748.0 as the initial version.^[24] Early versions of Chromium 13 included a menu button to enable users to switch between multiple Google profiles, multi-selection of tabs and an improved omnibox engine. This version also included several minor GUI changes, including a slightly lightened menu bar.^[68] By early May 2011 the results of Google's attempts to reduce the file size of Chromium were already being noted. Much of the early work in this area concentrated on shrinking the size of WebKit, by removing Wireless Markup Language (WML), the Image Resizer, datagrids and the Android build system. The largest Chromium nightly build was 35.3

MB on 15 April 2011, but this was reduced to 29.9 MB by 20 April 2011.^[69] Later builds of Chromium and Chrome in mid-May 2011 introduced the optional "compact navigation view", aimed at mobile device users. This view combined the tabs, URL bar and menu bar into one bar, by making the URL bar hide when not in use, thus saving 30 pixels of vertical space.^{[70][71]}

Chromium 14.0 was released on 2 June 2011, with 14.0.783.0 as the initial version. This initial version included `about:flags` testing support for preloading instant searches, permitting the user to preload the default search engine used in *instant search* and GPU acceleration on all pages. Default changes include a 2D-accelerated canvas and the task manager incorporated a *frames-per-second* counter. There was also support for the Page Visibility API. By the time development of Chromium 14 had been completed and Chrome 14 stable released this version also incorporated Mac OS X Lion scrollbar compatibility and "presentation mode". It also had support for the new Web Audio API and Google Native Client (NaCl) which permits native code supplied by third parties as platform-neutral binaries to be securely executed within the browser itself.^{[24][72][73]}

Chromium 15.0 was released on 28 July 2011, with 15.0.837.0 as the initial version. Work in this version included integrating the profiles and synchronization features, including moving synchronization into the main menu and introducing a profile manager. Synchronization data will be encrypted by default. Chromium 15 also expands webpage pre-rendering. Dan Bailey of *Conceivably Tech* stated about this version and the development of it, "it is obvious that Google is plugging along and is fine-tuning its browser ... Chrome isn't surrendering its perception of the most advanced browser today anytime soon." As development wound up in early September 2011 Chromium 15 also gained a "self-crashing" feature that crashes the browser if a close command is not completed in 25 seconds, smooth scrolling when using the space bar, automatic pre- and auto-logins to Google's own web pages, task bar logos to show different profiles, greatly enhanced synchronization customization, including optional search engine synchronization and improvements to the pre-rendering process.^{[24][74][75]}

Chromium 16.0 was released on 10 September 2011, with 16.0.877.0 as the initial version.^[24] Early in the development of version 16 an experimental Offscreen Tabs Module was incorporated which allows simultaneous user interaction with multiple web pages. This version for macOS included a move to Google's Skia 2D graphics library in place of Apple's core graphics as previously used. This aligned Chromium for macOS with the Windows and Linux versions.^{[76][77]}

Chromium 17.0 was released on 19 October 2011, with the initial release version 17.0.913.0.^[24] This version introduced HTTP pipelining as a test feature to increase web page load speed, starting with build 106364. Development on Chromium 17 near the end of November 2011 included the Gamepad API, specifically intended to allow game inputs from joysticks and other gaming-oriented pointing devices. Other work included being able to move profile icons directly to the desktop in Windows.^{[78][79]}

Chromium 18.0 was released on 7 December 2011, with the initial release version 18.0.964.0.^[24] Nightly builds of Chromium 18 showed that this cycle included work on menu organization. In January 2012 the builds reworked the *Options* menu to eliminate the *Basics*, *Personal Stuff* and *Under the Hood* pages and unite them into one menu named *options*. The new menu simplifies selections and hides privacy and proxy settings and security certificate management. Additional features included omnibox suggestion visualization.^[80]

2012

Chromium 19.0 was released on 2 February 2012, with the initial release version 19.0.1028.0.^[24] Support for Android was added. Chromium 19 development led to the release of Chrome 19.0.1084.46 on 15 May 2012, which incorporated many bug fixes along with a tab synchronization feature that allowed users to have the same tabs open on Chrome on different devices through "signing into Chrome".^{[81][82][83]}

Chromium 20.0 was released on 29 March 2012, with the initial release version 20.0.1086.0. This development cycle resulted in the release of Google Chrome 20.0.1132.43 on 26 June 2012, which was predominately a bug-fix update with few new features.^{[24][84][85]}

Chromium 21.0 was released on 11 May 2012, with the initial release version 21.0.1134.0. This development cycle resulted in Google Chrome 21.0.1180.57 for macOS and Linux and Chrome 21.0.1180.60 for Windows and Chrome Frame, released on 31 July 2012. Chrome 21 incorporated a new API to enable high-quality video and audio communication, complete support for Apple's retina display and a large number of bug fixes. The release included the getUserMedia JavaScript API, which permits web applications access the user's webcam and microphone after asking permission to do so.^{[24][86][87]}

Chromium 22.0 was released on 21 June 2012, with the initial release version 22.0.1181.0. This development cycle resulted in the release of Google Chrome 22.0.1229.79 on 25 September 2012. It incorporated Mouse Lock API availability for JavaScript, Windows 8 and HiDPI/Retina improvements, and many security and bug fixes.^{[24][88]}

Chromium 23.0 was released on 9 August 2012, with the initial release version 23.0.1231.0.^[24] This development cycle resulted in the release of Chrome 23.0.1271.64 on 6 November 2012, which incorporated easier website permissions, plus GPU accelerated video decoding for Windows.^[89]

Chromium 24.0 was released on 20 September 2012, with the initial release version 24.0.1272.0.^{[24][90]} This development cycle resulted in the release of Chrome 24.0.1312.52 on 10 January 2013, which incorporated support for MathML which allows mathematical equations to be displayed, HTML5 datalists for date and time and a large number of security and bug fixes.^[91] This release marked a total of a 26% increase in page loading speed achieved in the releases over the previous 12 months.^[92]

Chromium 25.0 was released on 1 November 2012, with the initial release version 25.0.1313.0. This development cycle resulted in the release of Chrome 25.0.1364.97 for Windows and Linux and 25.0.1364.99 for macOS on 21 February 2013. This release introduced extension improvements, improved support for HTML5 time and date inputs, JavaScript Web Speech API support and improved WebGL error handling, plus many bug fixes.^{[24][93]}

Chromium 26.0 was released on 20 December 2012, with the initial release version 26.0.1366.0.^[24] This development cycle resulted in the release of Chrome 26.0.1410.43 on 26 March 2013. This release incorporated a new "Ask Google for suggestions", spell checking feature improvements, which includes grammar and homonym checking, desktop shortcuts for multiple users on Windows, and asynchronous DNS resolver improvements for Mac OS-X and Linux.^[94]

2013

The first new release for 2013 was Chromium 27.0, which first came out on 14 February 2013, as 27.0.1412.0. This development cycle resulted in the release of Chrome 27.0.1453.93 on 21 May 2013. This version incorporated a page loading speed improvement of an average of 5%, the

chrome.syncFileSystem API, improved prediction ranking and Omnibox predictions and improved spelling correction.^{[24][95]}

Chromium 28.0 was released on 28 March 2013, with the initial release version 28.0.1455.0. This development cycle resulted in the release of Google Chrome 28.0.1500.45 for Linux only on 17 June 2013. On Linux this version requires Ubuntu 12.04, Debian 7, openSUSE 12.2 or Fedora Linux 17 and later releases to run.^{[24][96]}

Chromium 29.0 was released on 9 May 2013, with the initial release version 29.0.1502.0.^[24] This development cycle resulted in the release of Chrome 29.0.1547.57 on 20 August 2013.^[97] This version incorporated improved Omnibox suggestions, the ability to reset user profiles, new applications and extension APIs and improvements in stability and performance.^[98] The Blink browser engine (a fork of the WebKit engine^{[99][100]}) was introduced on 4 April 2013 in Chromium 28.0.1463.0.^[101]

Chromium 30.0 was released on 27 June 2013, with the initial release version 30.0.1549.0.^[24] This development cycle resulted in the release of Chrome 30.0.1599.66 on 1 October 2013. This incorporated improved image searching, new applications and extension APIs, performance and stability enhancements and 50 bug fixes.^[102]

Chromium 31.0 was released on 13 August 2013, with the initial release version 31.0.1600.0.^[24] This development cycle resulted in the release of Chrome 31.0.1650.48 on 12 November 2013. This version of Chrome introduced only bug fixes with no new features.^[103]

Chromium was considered as the default browser for Ubuntu 13.10, which was released on 17 October 2013, but Firefox remained the default browser due to problems keeping the Chromium packages up-to-date.^[104]

Chromium 32.0 was released on 25 September 2013, with the initial release version 32.0.1651.2.^[24] This development cycle resulted in the release of Chrome 32.0.1700.76 for Windows and Chrome Frame and 32.0.1700.77 for Mac and Linux on 14 January 2014. This release incorporated tab indicators for sound, webcam and casting, visual changes to the version for Windows 8 in Metro mode, automatically blocking of files detected as malware, several new apps and extension APIs, and improved stability and performance.^[105]

Chromium 33.0 was released on 6 November 2013, with the initial release version 33.0.1701.0.^[24] This development cycle resulted in the release of Chrome 33.0.1750.117 on 20 February 2014, which was predominately a bug-fix release.^[106]

Chromium 34.0 was released on 18 December 2013, with the initial release version 34.0.1751.0.^[24] This cycle resulted in the release of Chrome 34.0.1847.116 on 8 April 2014. This version included the ability to import supervised users onto new computers, additional new apps/extension APIs and a different appearance for Chrome in Windows 8 Metro mode.^[107]

2014

Chromium 35.0 was released on 20 February 2014, with the initial release version 35.0.1849.0.^[24] This development cycle resulted in the release of Chrome 35.0.1916.114 on 20 May 2014. Chrome 35 incorporated improved developer control over touch input, new JavaScript features, an unprefixed Shadow DOM, some new apps and extension APIs, plus stability and performance enhancements.^[108]

Chromium 36.0 was released on 31 March 2014, with the initial release version 36.0.1917.0.^[24] This development cycle resulted in the release of Chrome 36.0.1985.125 on 16 July 2014. The release included improvements to notifications, a new incognito and guest NTP design, a new crash recovery bubble, an application launcher for Linux, improvements to stability and performance and 26 security fixes.^[109]

Chromium 37.0 was released on 11 May 2014, with the initial release version 37.0.1986.0.^[24] This development cycle resulted in the release of Chrome 37.0.2062.94 on 26 August 2014. Chrome 37 included Windows DirectWrite support to improve font rendering, new apps/extension APIs, improvements to stability and performance, and 50 security fixes.^[110]

Chromium 38.0 was released on 22 June 2014, with the initial release version 38.0.2063.0.^[24] This development cycle resulted in the release of Chrome 38.0.2125.101 on 7 October 2014. Chrome 38 included just bug fixes and improvements to stability and performance.^[111]

Chromium 39.0 was released on 17 August 2014, with the initial release version 39.0.2126.0.^[24] This development cycle resulted in the release of Chrome 39.0.2171.65 on 18 November 2014. Chrome 39 included 64-bit support for Mac computers, some new application and extension APIs as well as stability and performance enhancements.^[112]

Chromium 40.0 was released on 28 September 2014, with the initial release version 40.0.2172.0. The development cycle resulted in the release of Chrome 40.0.2214.91 on 21 January 2015. This version was predominately a bug-fix release with 62 security issues addressed.^{[12][113]}

Chromium 41.0 was released on 9 November 2014, with the initial release version 41.0.2215.0.^[12] This development cycle resulted in the release of Chrome 41.0.2272.76 on 3 March 2015. This version was predominately a "stability and performance" and bug-fix release with 51 security issues addressed.^[114]

2015

Chromium 42.0 was released on 12 January 2015, with the initial release version 42.0.2273.0.^[12] This development cycle resulted in the release of Chrome 42.0.2311.90 on 14 April 2015. This release included new application and API support and improvements to stability and performance. In deference to its version number Google also claimed that it contained, "the answer to life, the universe and everything".^[115]

Chromium 43.0 was released on 22 February 2015, with the initial release version 43.0.2312.0.^[12] This development cycle resulted in the release of Chrome 43.0.2357.65 on 19 May 2015. It was primarily a security-fix update.^[116] Chromium 43 was reported by Debian developers as automatically downloading the binary blob *Chrome Hotword Shared Module* extension, a library for Google's OK Google voice recognition feature. Security researchers have indicated that this code carries a risk of invasion of privacy. This was fixed in Chromium 45.0 with newer versions no longer automatically downloading the *Chrome Hotword Shared Module*, but the Debian community remained suspicious of the browser and Google.^{[117][118][119][120]}

Chromium 44.0 was released on 7 April 2015, with the initial release version 44.0.2359.0.^[12] This development cycle resulted in the release of Chrome 44.0.2403.89 on 21 July 2015. This version included some new apps and extension APIs, some changes to improve stability and performance and 43 security fixes.^[121]

The remainder of the Chromium releases for the year were just bug and security fix updates, with no other significant changes.^{[12][122][123][124][125][126]}

2016

Chromium 50.0, released on 18 January 2016, added support for Brotli compression via the `br` Accept-encoding header.^[127] Chrome 54, released on 12 October 2016 and based upon Chromium 54, introduced support for HTML Custom Elements.^{[128][129]}

The remainder of the Chromium releases for 2016 were only bug and security fix updates, with no other significant changes.

2017

Chromium 59.0, released on 4 March 2017, added support for the Animated Portable Network Graphics (APNG) file format.^{[12][130][131]}

The remainder of the Chromium releases for 2017 were only bug and security fix updates, with no other significant changes.

2018

Chromium 66.0, first released on 20 January 2018, introduced audio muting for all autoplaying video content by default.^{[12][132]}

Chromium 69.0, first released on 19 July 2018 and the stable version on 4 September 2018, introduced a new material theme as part of 10-year project anniversary.^{[133][134]}

Chromium 71, was first released on 1 September 2018 and resulted in Chrome 71, released on 4 December 2018. This version incorporated new measures aimed at abusive advertising, including misleading advertising and advertising for cell phones that aims to bill users.^{[12][135]}

Snapshots

Chromium snapshots are built automatically several times a day by Buildbot *Buildworkers* and made available as binary code releases.^[136] Once a snapshot has been built, it is placed in a directory in the chromium-browser-snapshots root directory^[137] and it is automatically tested.^[138] If the snapshot passes the automated testing, it is placed in a directory in the chromium-browser-continuous root directory.^[139]

Chromium builds can be downloaded for most Linux distributions and BSD operating systems from their respective software repositories. Chromium builds for Windows and Mac can be downloaded directly. Unlike Chrome releases, Chromium releases do not automatically update.^[140]

Browsers based on Chromium

In addition to Google Chrome, many other notable web browsers have been based on the Chromium code.

Active

- Amazon Silk
- Avast Secure Browser developed by Avast
- Blisk is a browser available for Windows 7 and later, OS X 10.9 and later that aims to provide an array of useful tools for Web development.
- Brave is an open-source web browser that aims to block website trackers and remove intrusive internet advertisements.
- CodeWeavers CrossOver Chromium is an unofficial bundle of a Wine derivative and Chromium Developer Build 21 for Linux and macOS, first released on 15 September 2008 by CodeWeavers as part of their CrossOver project.^{[141][142]}
- Comodo Dragon is a rebranded version of Chromium for 32-bit Windows 8.1, 8, Windows 7 and Vista^[143] produced by the Comodo Group. According to the developer, it provides improved security and privacy features.^[144]
- Cốc Cốc is a freeware web browser focused on the Vietnamese market, developed by Vietnamese company Cốc Cốc, based on Chromium open-source code for Windows.^[145] According to data published by StatCounter in July 2013, Cốc Cốc has passed Opera to become one of the top 5 most popular browsers in Vietnam^[146] within 2 months after its official release.^[147]
- Epic Browser is a privacy-centric web browser developed by Hidden Reflex of India and based on Chromium source code.^[148]
- Falkon a QT-based GUI, based on the Chromium core.^[149]
- Microsoft Edge is Chromium-based as of January 15, 2020.^{[150][151]}
- Naver Whale is a South Korean freeware web browser developed by Naver Corporation, which is also available in English. It became available on Android on April 13, 2018.
- Opera began to base its web browser on Chromium with version 15.^[152]
- Qihoo 360 Secure Browser is a popular web browser in China.^[153]
- SalamWeb is a web browser based on Chromium for Muslims allowing to view positive websites/information only (called Halal).
- Samsung Internet shipped its first Chromium-based browser in a Galaxy S4 model released in 2013.^[154]
- Sleipnir is a Chromium derivative browser for Windows and macOS. One of its main features is linking to Web apps (Facebook, Twitter, Dropbox, etc.) and smartphone apps (Google Map, etc.). It also boasts what it calls "beautiful text," and has unique graphical tabs, among other features.^[155]
- Slimjet: A Chromium-based web browser released by FlashPeak that features built-in webpage translation, PDF viewing capability and a PPAPI flash plugin, features usually missing from Chromium-based browsers currently not supported.
- SRWare Iron is a freeware release of Chromium for Windows, macOS and Linux, offering both installable and portable versions. Iron disables certain configurable Chromium features that could share information with third parties and additional tracking features that Google adds to its Chrome browser.^[156]
- Torch is a browser based on Chromium for Windows. It specializes in media downloading and has built-in media features, including a torrent engine, video grabber and sharing button.^[157]
- Vivaldi is a browser for Windows, macOS and Linux developed by Vivaldi Technologies.^{[158][159]} The browser is aimed at previous Opera web browser users. Vivaldi aims to revive the old, popular features of Opera 12 and introduce new ones.

- Yandex browser is a browser created by the Russian software company Yandex for macOS, Windows and Linux.^[160] The browser integrates Yandex services, which include a search engine, a machine translation service and cloud storage.

Discontinued

- Flock – a browser that specialized in providing social networking and had Web 2.0 facilities built into its user interface. It was based on Chromium starting with version 3.0. Flock was discontinued in April 2011.^{[161][162]}
- Redcore – a browser developed by Chinese company Redcore Times (Beijing) Technology Ltd.. and marketed as a domestic product that was developed in-house, but was revealed to be based on Chromium^[163]
- Rockmelt – a Chromium-based browser for Windows, macOS, Android and iOS under a commercial proprietary licence. It integrated features from Facebook and Twitter, but was discontinued in April 2013 and fully retired at 10am PT on July 31, 2013.^{[164][165]} On August 2, 2013, Rockmelt was acquired by Yahoo! Rockmelt's extensions and its website was shut down after August 31, 2013. Yahoo! plans to integrate Rockmelt's technology into other products.^[166]

See also

- Chromium OS
- Chromium Embedded Framework
- List of web browsers

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