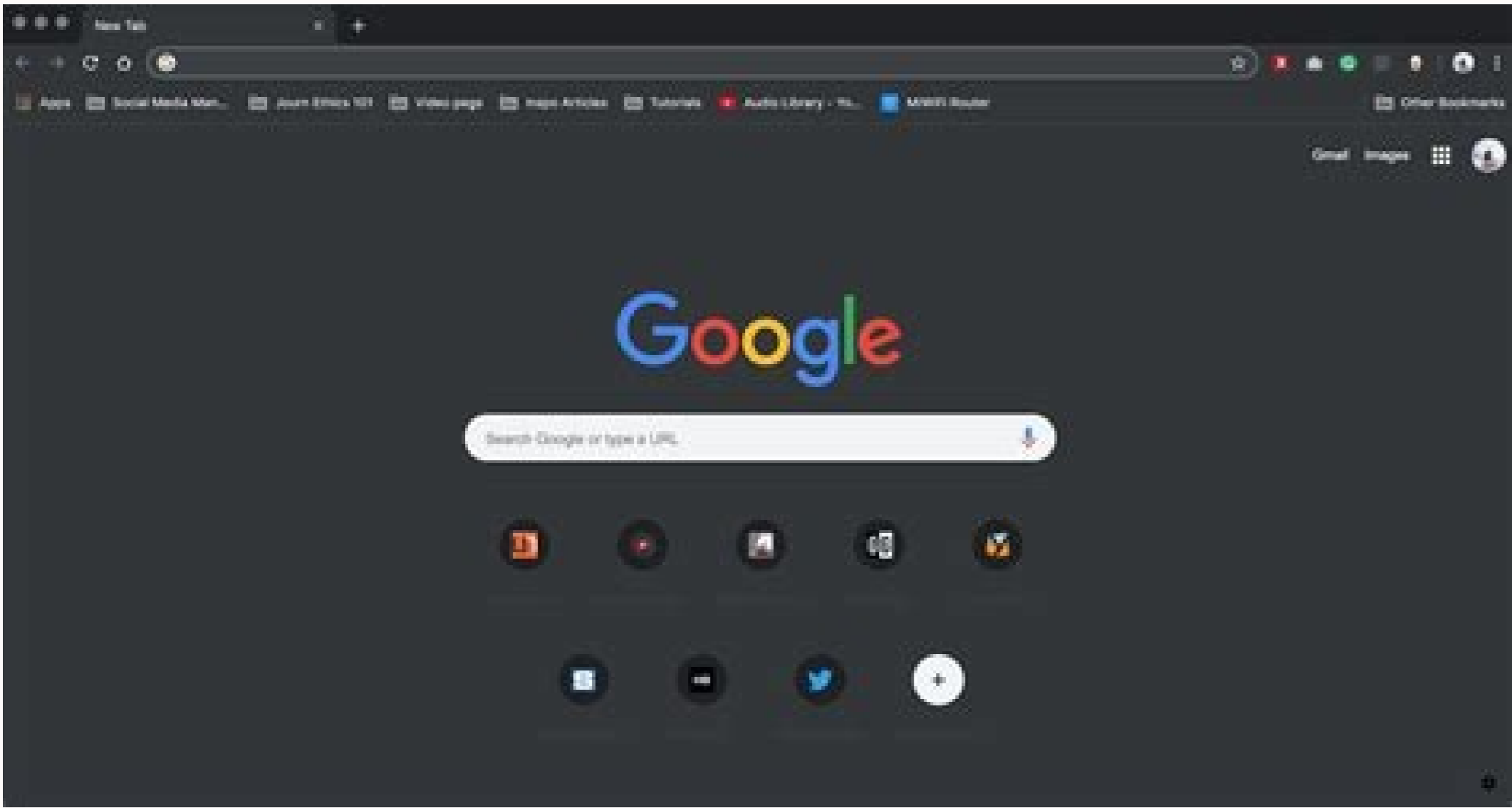


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Most recent chrome os version. Is chrome os still supported. What is the newest version of chrome os.

Linux-based operating system developed by Google This article is about the operating system. For the web browser, see Google Chrome. Chrome OS Chrome OS logo as of March 2022 Chrome OS 87 Desktop Developer Google Written in C, C++, assembly, JavaScript, HTML5, Python, Rust OS family Linux (Unix-like)[1] Working state Preinstalled on Chromebooks, Chromeboxes, Chromeblends, Chromebases Source model Closed-source with open-source components Initial release June 15, 2011; 11 years ago (2011-06-15) Latest release 104.0.5112.83 (August 4, 2022; 3 days ago (2022-08-04)[2]) (±) Latest preview Beta 105.0.5195.19 (August 4, 2022; 3 days ago (2022-08-04)[3]) (±) Dev 105.0.5195.5 (July 27, 2022; 11 days ago (2022-07-27)[4]) (±) Repository chromium.googlesource.com/codesearch/chromium/src/+refs/heads/master-original/chromeos/Update method Rolling release Package manager Portage[a] Platforms ARM32, ARM64, x86, x86-64 Kernel type Monolithic (Linux kernel)[6] Userland AURa Shell (Ash), Ozone (display manager); X11 apps can be enabled in recent Chrome OS Default user interface Google Chrome License Proprietary[7] Official website www.google.com/chromebook/chrome-os/ Chrome OS,[8] formerly known as Chrome OS, is a Linux-based operating system designed by Google. It is derived from the open-source Chromium OS and uses the Google Chrome web browser as its principal user interface. Google announced the project in July 2009, initially describing it as an operating system where applications and user data would reside in the cloud. Chrome OS was used primarily to run web applications.[9] All Chromium OS and Chrome OS versions support progressive web applications (such as Google Docs or Microsoft Office 365), as well as web browser extensions (which can resemble native applications). Chrome OS (but not Chromium OS) from 2016 onwards can also run Android applications from the Play Store.[10] Since 2018, Chromium OS/Chrome OS version 69 onwards also support Linux applications, which are executed in a lightweight virtual machine[11] with a Debian Linux environment.[12][13] The operating system is now rarely evaluated apart from the hardware that runs it. History To ascertain marketing requirements, developers relied on informal metrics, including monitoring the usage patterns of some 200 machines used by Google employees. Developers also noted their own usage patterns.[14] Chrome OS was initially intended for secondary devices like netbooks, and not as a user's primary PC.[15][16] Google has requested that its hardware partners use solid-state drives "for performance and reliability reasons"[17] as well as the lower capacity requirements inherent in an operating system that accesses applications and most user data on remote servers. In November 2009, Matthew Papakipos, engineering director for the Chrome OS, announced that Chrome OS would only support solid-state storage (i.e. not mechanical hard-disks), and noted that Chrome OS only required one-sixtieth as much drive space as Windows 7.[18] Ten years later, in 2019, the recovery images Google provided for Chrome OS were still only between 1 and 3 GB in size.[19] In November 19, 2009, Google released Chrome OS's source code as the Chromium OS project.[20] At a November 19, 2009 news conference, Sundar Pichai—at the time Google's vice president overseeing Chrome—demonstrated an early version of the operating system. He previewed a desktop which looked very similar to the desktop Chrome browser, and in addition to the regular browser tabs also had application tabs, which take less space and can be pinned for easier access. At the conference, the operating system booted up in seven seconds, a time Google said it would work to reduce.[17][15][21][22] Additionally, Chris Kenyon, vice president of OEM services at Canonical Ltd, announced that Canonical was under contract to contribute engineering resources to the project with the intent to build on existing open-source components and tools where feasible.[23] Canonical was an early engineering partner on the project,[23] and initially Chromium OS could only be built on an Ubuntu system. In February 2010, the Chromium OS development team switched to Gentoo Linux because Gentoo's package management system Portage was more flexible.[24] The Chromium OS build environment is no longer restricted to any particular distribution, but installation and quick-start guides use Debian's (and thus also Ubuntu's) apt syntax. Early Chromebooks (2010) In 2010, Google released the unbranded Cr-48 Chromebook in a pilot program.[25][26] The launch date for retail hardware featuring Chrome OS was delayed from late 2010[27] until the next year. On May 11, 2011, Google announced two Chromebooks from Acer and Samsung at Google I/O.[28][29] The Samsung model was released on June 15, 2011, and the Acer model in mid-July.[30][31] In August 2011, Netflix announced official support for Chrome OS through its streaming service, allowing Chromebooks to watch streaming movies and TV shows via Netflix. At the time, other devices had to use Microsoft Silverlight to play videos from Netflix.[32] Later in that same month, Citrix released a client application for Chrome OS, allowing Chromebooks to access Windows applications and desktops remotely.[33] Dublin City University became the first educational institution in Europe to provide Chromebooks for its students when it announced an agreement with Google in September 2011.[34] Expansion (2012) Samsung Chromebook By 2012, demand for Chromebooks had begun to grow, and Google announced a new range of devices, designed and manufactured by Samsung. In so doing, they also released the first Chromebox, the Samsung Series 3, which was Chrome OS' entrance into the world of desktop computers.[35] Although they were faster than the previous range of devices, they were still underpowered compared to other desktops and laptops of the time, fitting in more closely with the Netbook market. Only months later, in October, Samsung and Google released a new Chromebook at a significantly lower price point (\$250, compared to the previous Series 5 Chromebooks' \$450).[36] It was the first Chromebook to use an ARM processor, one from Samsung's Exynos line. To reduce the price, Google and Samsung also reduced the memory and screen resolution of the device. An advantage of using the ARM processor, however, was that the Chromebook didn't require a fan. Acer followed quickly after with the C7 Chromebook, priced even lower (\$199), but containing an Intel Celeron processor.[37] One notable way Acer reduced the cost of the C7 was to use a laptop hard disk rather than a solid-state drive. In April 2012, Google made the first update to Chrome OS's user interface since the operating system had launched, introducing a hardware-accelerated window manager called "Aura" along with a conventional taskbar. The additions marked a departure from the operating system's original concept of a single browser with tabs and gave Chrome OS the look and feel of a more conventional desktop operating system. "In a way, this almost feels as if Google is admitting defeat here", wrote Frederic Lardinois on TechCrunch. He argued that Google had traded its original version of simplicity for greater functionality. "That's not necessarily a bad thing, though, and may just help Chrome OS gain more mainstream acceptance as new users will surely find it to be a more familiar experience."[38] Lenovo and HP followed Samsung and Acer in manufacturing Chromebooks in early 2013 with their own models.[39] Lenovo specifically targeted their Chromebook at students, headlining their press release with "Lenovo Introduces Rugged ThinkPad Chromebook for Schools".[40][41] When Google released Google Drive, they also included Drive integration in Chrome OS version 20, released in July 2012.[42] While Chrome OS had supported Flash since 2010,[43] by the end of 2012 it had been fully sandboxed, preventing issues with Flash from affecting other parts of Chrome OS.[44] This affected all versions of Chrome including Chrome OS. Chromebook Pixel (2013) Main article: Chromebook Pixel Chromebook Pixel (Wi-Fi) open until 2013. Google had never made their own Chrome OS device. Instead, Chrome OS devices were much more similar to their Nexus line of Android phones, with each Chrome OS device being designed, manufactured, and marketed by third-party manufacturers, but with Google controlling the software. However, in February 2013 this changed when Google released the Chromebook Pixel.[45] The Chromebook Pixel was totally different from previous devices. Not only was it entirely Google-branded, but it contained an Intel i5 processor, a high-resolution (2,560 × 1,700) touchscreen display, and came at a price more competitive with business laptops.[46] From an uncertain future (2013) to massive growth (2020) By the end of 2013, analysts were undecided on the future of Chrome OS. Although there had been articles predicting the demise of Chrome OS since 2009,[47][48][49][50][51] Chrome OS device sales continued to increase substantially year-over-year. In mid-2014, Time magazine published an article titled "Depending on Who's Counting, Chromebooks are Either an Enormous Hit or Totally Irrelevant", which detailed the differences in opinion.[52] This uncertainty was further spurred by Intel's announcement of Intel-based Chromebooks, Chromeboxes, and an all-in-one offering from LG called the Chromebase.[53] Seizing the opportunity created by the end of life for Windows XP, Google pushed hard to sell Chromebooks to businesses, offering significant discounts in early 2014.[54] Chrome OS devices outside Apple Macs worldwide for the year 2020.[55][56][57] Pwnium competition In March 2014, Google hosted a hacking contest aimed at computer security experts called "Pwnium". Similar to the Pwn2Own contest, they invited hackers from around the world to find exploits in Chrome OS, with prizes available for attacks. Two exploits were demonstrated there, and a third was demonstrated at that year's Pwn2Own competition. Google patched the issues within a week.[58] Material Design and app runtime for Chrome Although the Google Native Client has been available on Chrome OS since 2010,[59] there originally were few Native Client apps available, and most Chrome OS apps were still web apps. However, in June 2014, Google announced at Google I/O that Chrome OS would both synchronise with Android phones to share notifications and begin to run Android apps, installed directly from Google Play.[60] This, along with the broadening selection of Chromebooks,[61] provided an interesting future for Chrome OS. At the same time, Google was also moving towards the then-new Material Design design language for its products, which it would bring to its web products as well as Android Lollipop.[62] One of the first Material Design items to come to Chrome OS was a new default wallpaper.[63] though Google did release some screenshots of a Material Design experiment for Chrome OS that never made it into the stable version.[64] Features Functionality for small and medium businesses and Enterprise Chrome Enterprise Chrome Enterprise, launched in 2017, includes Chrome OS, Chrome Browser, Chrome devices and their management capabilities intended for business use. Businesses can access the standard Chrome OS features and unlock advanced features for business with the Chrome Enterprise Upgrade.[65][66] Standard features include the ability to sync bookmarks and browser extensions across devices, cloud or native printing, multi-layered security, remote desktop, and automatic updates.[67] Advanced features include Active Directory integration, unified endpoint management, advanced security protection, access to device policies and Google Admin console, guest access, kiosk mode, and whitelisting or blacklisting third-party apps managed on Google Play.[68][69] The education sector was an early adopter of Chromebooks, Chrome OS, and cloud-based computing. Chromebooks are widely used in classrooms and the advantages of cloud-based systems have been gaining an increased share of the market in other sectors as well, including financial services, healthcare, and retail.[70] "The popularity of cloud computing and cloud-based services highlights the degree to which companies and business processes have become both internet-enabled and dependent." [71] IT managers cite a number of advantages of the cloud that have motivated the move. Among them are advanced security, because data is not physically on a single machine that can be lost or stolen.[72] Deploying and managing cloud-native devices is easier because no hardware and software upgrades or virus definition updates are needed and patching of OS and software updates are simpler. Simplified and centralized management decreases operational costs. Employees can securely access files and work on any machine, increasing the shareability of Chrome devices. Google's Grab and Go program with Chrome Enterprise allows businesses deploying Chromebooks to provide employees access to a bank of fully charged computers that can be checked out and returned after some time.[73] From Chromebooks to Chromebox and Chromebase In an early attempt to expand its enterprise offerings, Google released Chromebox for Meetings in February 2014. Chromebox for Meetings is a kit for conference rooms containing a Chromebox, a camera, a unit containing both a noise-cancelling microphone and speakers, and a remote control. It supports Google Hangouts meetings, Vido video conferences, and conference calls from UberConference.[74][75] Several partners announced Chromebox for Meetings models with Google, and in 2016 Google announced an all-in-one Chromebase for Meetings for smaller meeting rooms.[76] Google targeted the consumer hardware market with the release of the Chromebook in 2011 and Chromebook Pixel in 2013, and sought access to the enterprise market with the 2017 release of the Pixelbook. The second-generation Pixelbook was released in 2019.[77] In 2021 there are several vendors selling all-in-one Chromebase devices.[78] Enterprise response to Chrome devices Google has partnered on Chrome devices with several leading OEMs, including Acer, ASUS, Dell, HP, Lenovo, and Samsung. In August 2019, Dell announced that two of its popular business-focused laptops would run Chrome OS and come with Chrome Enterprise Upgrade. The Latitude 5300 2-in-1 Chromebook Enterprise and Latitude 5400 Chromebook Enterprise were the result of a two-year partnership between Dell and Google. [79] The machines come with a bundle of Dell's cloud-based support services that would enable enterprise IT managers to deploy them in environments that also rely on Windows.[80] The new laptop line "delivers the search giant's Chrome OS operating system in a form tailored for security-conscious organizations." [81] Other OEMs that have launched devices with Chrome Enterprise Upgrade include Acer and HP.[82] With a broader range of hardware available, Chrome OS became an option for enterprises wishing to avoid a migration to Windows 10 before Windows 7 support was discontinued by Microsoft.[83] Hardware Main articles: Chromebook, Chromebox, and Chromebit A Chromebook Laptops running Chrome OS are known collectively as "Chromebooks". The first was the CR-48, a reference hardware design that Google gave to testers and reviewers beginning in December 2010. Retail machines followed in May 2011. A year later, in May 2012, a desktop design marketed as a "Chromebox" was released by Samsung. In March 2015 a partnership with AOPEN was announced and the first commercial Chromebox was developed.[84] In early 2014, LG Electronics introduced the first device belonging to the new all-in-one form factor called "Chromebase". Chromebase devices are essentially Chromebox hardware inside a monitor with a built-in camera, microphone and speakers. The Chromebit is an HDMI coded running Chrome OS. When placed in an HDMI slot on a television set or computer monitor, the device turns that display into a personal computer. The first device, announced in March 2015 was an Asus unit that shipped that November and which reached end of life in November 2020.[85] Chromebook tablets were introduced in March 2018 by Acer with their Chromebook Tab 10. Designed to rival the Apple iPad, it had an identical screen size and resolution and other similar specifications, a notable addition was a Wacom-branded stylus that doesn't require a battery or charging.[86] Chrome OS supports multi-monitor setups, on devices with a video-out port, USB 3.0 or USB-C, the latter being preferable.[87] On February 16, 2022, Google announced a development version of Chrome OS Flex—a distribution of Chrome OS that can be installed on conventional PC hardware to replace other operating systems such as Windows and macOS. It is similar to CloudReady, a distribution of Chromium OS whose developers were acquired by Google in 2020.[88][89] Software The software and updates are limited in their support lifetime.[90][91] Each device model manufactured to run Chrome OS has a different end-of-life date, with all new devices released in 2020 and beyond guaranteed to receive a minimum of eight years from their date of initial release.[92] As of Version 78, the device's end-of-life date for software updates is listed in "About Chrome OS"- "Additional Details".[93] Applications Initially, Chrome OS was a pure thin client operating system that relied primarily on servers to host web applications and related data storage.[94][95] Google gradually began encouraging developers to create "packaged applications", and later, Chrome Apps by employing HTML5, CSS, Adobe Shockwave, and JavaScript to provide a user experience closer to a native application.[96][97] In September 2014, Google launched App Runtime for Chrome (beta), which allowed certain ported[98] Android applications to run on Chrome OS. In March 2015, Google launched the Android Platform Module (TPM), which allowed Chrome OS to run Android applications. Chrome OS was designed to be able to run Android applications, but it was not initially intended to be used on Chrome OS, but Chrome Apps (formerly known as Packaged Apps).[104] In January 2020, Google's Chrome team announced its intent to phase out support for Chrome Apps in favor of "progressive web applications" (PWA) and Chrome Extensions instead.[105] In March 2020, Google stopped developing new public just-convention Web applications for Chrome OS. According to Google, general support for Chrome Apps on Chrome OS will remain enabled, without requiring any policy setting, through June 2022.[106] From a user's perspective, Chrome Apps resemble conventional native applications: they can be launched outside of the Chrome browser, are offline by default, can manage multiple windows, and interact with other applications. [107][108][109] Integrated media player, file manager Google integrated a media player into both Chrome OS and the Chrome browser, enabling users to play back MP3s, view JPEGs, and handle other multimedia files without connectivity.[110] The integration also supports DRM videos.[111] Chrome OS also includes an integrated file manager, resembling those found on other operating systems, with the ability to display directories and the files they contain from both Google Drive and local storage, as well as to preview and manage file contents using a variety of Web applications, including Google Docs and Box.[112] Since January 2015, Chrome OS can also integrate additional storage sources into the file manager, relying on installed extensions that use the File System Provider API.[113] Remote application access and virtual desktop access In June 2010, Google's software engineer Gary Kacmarcik wrote that Chrome OS would access remote applications through a technology unofficially called "Chromoting", which would resemble Microsoft's Remote Desktop Connection.[110] The name has since been changed to "Chrome Remote Desktop", and is like "running an application via Remote Desktop Services or by first connecting to a host machine by using RDP or VNC".[114] Initial roll-outs of Chrome OS laptops (Chromebooks) indicate an interest in enabling users to access virtual desktops.[115][116] Android applications At Google I/O 2014, a proof of concept showing Android applications, including Flipboard, running on Chrome OS was presented. In September 2014, Google introduced a beta version of the App Runtime for Chrome (ARC), which allows selected Android applications to be used on Chrome OS, using a Native Client-based environment that provides the platforms necessary to run Android software. Android applications do not require any modifications to run on Chrome OS, but may be modified to support a mouse and keyboard environment. At its introduction, Chrome OS support was only available for selected Android applications.[117] In 2016, Google introduced the ability to run Android apps on supported Chrome OS devices, with access to Google Play in its entirety. The previous Native Client-based solution was dropped in favor of a container containing Android's frameworks and dependencies (initially based on Android Marshmallow), which allows Android apps to have direct access to the Chrome OS platform, and allow the OS to interact with Android contracts such as sharing. Engineering director Zelidrag Hornung explained that ARC had been scrapped due to its limitations, including its incompatibility with the Android Native Development Toolkit (NDK), and that it was unable to pass Google's own compatibility test suite.[118][119] Linux apps All Chromebooks made since 2018, and many earlier models, can run Linux apps. As with Android apps, these apps can be installed and launched alongside other apps.[120] Google maintains a list of devices that were launched before 2019, which support Linux apps.[121][122] Since 2013, it has been possible to run Linux applications in Chrome OS through the use of Crouton, a third-party set of scripts that allows access to a Linux distribution such as Ubuntu.[123] However, in 2018 Google announced that desktop Linux apps were officially coming to Chrome OS.[124] The main benefit claimed by Google of their official Linux application support is that it can run without enabling developer mode, keeping many of the security features of Chrome OS. It was noticed in the Chromium OS source code in early 2018.[125][126] Early parts of Crostini were made available for the Google Pixelbook via the dev channel in February 2018 as part of Chrome OS version 66.[127][128] and it was enabled by default via the beta channel for testing on a variety of Chromebooks in August 2018 with version 69.[129] Architecture Google's project for supporting Linux applications in Chrome OS is called Crostini, named for the Italian bread-based starter, and as a pun on Crouton. Crostini runs a virtual machine through a virtual machine monitor called crosvm, which uses Linux's built-in KVM virtualization tool. Although crosvm supports multiple virtual machines, the one used for running Linux apps, Termina, contains a basic Chrome OS kernel based on Gentoo and userland utilities, in which it runs containers based on LXD.[11] Architecture Chrome OS is built on top of the Linux kernel. Originally based on Ubuntu, its base was changed to Gentoo Linux in February 2010.[130] For Project Crostini, as of Chrome OS 80, Debian 10 (Buster) is the default container base image[131] In preliminary design documents for the Chromium OS open-source project, Google described a three-tier architecture: firmware, browser and window manager, and system-level software and userland services.[132] The firmware contributes to fast boot time by not probing for hardware, such as floppy disk drives, that are no longer common on computers, especially netbooks. The firmware also contributes to security by verifying each step in the boot process and incorporating system recovery.[132] System-level software includes the Linux kernel that has been patched to improve boot performance. Userland software has been trimmed to essentials, with management by Upstart, which can launch services in parallel, re-spawning crashed jobs, and defer services in the interest of faster booting.[132] The window manager handles user interaction with multiple client windows (much like other X window managers).[132] Security In March 2010, Google software security engineer Will Drewry discussed Chrome OS security. Drewry described Chrome OS as a "hardened" operating system featuring auto-updating and sandbox features that would reduce malware exposure. He said that Chrome OS netbooks would be shipped with Trusted Platform Module (TPM), and include both a "trusted boot path" and a physical switch under the battery compartment that activates a "developer mode". That mode drops some specialized security functions but increases developer flexibility. Drewry also emphasized that the open-source nature of the operating system would contribute greatly to its security by allowing constant developer feedback.[133] At a December 2010 press conference, Google declared that Chrome OS would be the most secure consumer operating system due in part to a verified boot ability, in which the initial boot code, stored in read-only memory, checks for system compromises. [134] In the following nine years, Chrome OS has been affected by 55 documented security flaws of any severity[135] compared with over 1,100 affecting Microsoft Windows 10 in the five years to the end of 2019[136] and over 2,200 affecting Apple OS X in 20 years.[137] Shell access Chrome OS includes the Chrome Shell, or "crosh",[138] which documents minimal functionality such as ping at crosh start-up. In developer mode, a full-featured bash[139] shell (which is supposed to be used for development purposes[140]) can be opened via VT-2, and is also accessible using the crosh command shell.[141] To access full privileges in shell (e.g. sudo) a root password is requested. For some time the default was "chronos" in Chrome OS and "facepunch" in Chrome OS Vanilla[142] and later the default was empty, and instructions on updating it were displayed at each login. Open source Chrome OS is partially developed under the open-source Chromium OS project.[143] As with other open-source projects, developers can modify the code from Chromium OS and build their own versions, whereas Chrome OS code is only supported by Google and its partners and only runs on hardware designed for the purpose. Unlike Chromium OS, Chrome OS is automatically updated to the latest version.[17] Chrome OS on Windows On Windows 8, exceptions allow the default desktop web browser to offer a variant of the Chrome OS desktop.[144][145][146][147][148] Design Early in the project, Google provided publicly many details of Chrome OS' design goals and direction.[149] although the company has not followed up with a technical description of the completed operating system. User interface Design goals for Chrome OS' user interface included using minimal screen space by combining applications and standard Web pages into a single tab strip, rather than separating the two. Designers considered a reduced window management scheme that would operate only in full-screen mode. Secondary tasks would be handled with "panels": floating windows that dock to the bottom of the screen for

