Android logo quiz answers level 3

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Can you identify these brands based on their logos? Some logos altered to remove text that would give away the answer Enter answer here The quiz is paused. You have remaining. Scoring You scored / = % This beats or equals % of test takers also scored 100% The average score is Your fastest time is Keep scrolling down for answers and more stats ... Here are the logo quiz answers by level number: Enjoy the videogame by Bubble Games for Android mobile devices and is also available for Windows Phone and PC, later Mateusz Klaczak developed it for Apple devices (iPhone, iPad), so you can find it in almost any format. This videogame has been translated into more than 30 languages and has become the most played logo game so far, with over 60,000,000 downloads. How to play Logo Quiz: Logo brand is behind a logo that is not shown complete. In each level you will be shown some pieces of the logo and you will be able to overcome it if you write the name of the brand to which it belongs. For this you will have as a track some empty boxes that will indicate the number of letters that the answer has. These boxes can be filled with some of the letters that will appear at the bottom of the screen. Guess the brands and have a great time showing how many logos you know. If you get stuck on some level, come to Logoquizs.com where you can find all the answers of the game. Would you like to try it? Here we leave the links so you can download it and start having fun right now. Download Logo QuizSelect your device for play with Logo Quiz Logos game and access the download for AndroidDownload for AndroidDownload for IOSImprove your memory with word games like Logoquiz improves some of your mental abilities like memory, problem solving, etc.?Enjoy this game and have fun while strengthening your mind!report this ad Logo Quiz answers solutions walkthrough for all levels!On this page you will find the answers, solution, walk through (company and the brand names) for Logo Quiz an addictive game created by AticoD. Logo Quiz is a great logo guessing game where you are given a cropped version of a brand logo and you have to guess the answer correctly. There is no time limit so you can enjoy it and play whenever you want. The most addictive game for android, iPhone and iPad Logo Quiz answers. If you are stuck and looking for Logo Quiz answers. If you are stuck and looking for Logo Quiz answers. If you are stuck and looking for Logo Quiz answers. If you are stuck and looking for Logo Quiz answers. If you are stuck and looking for Logo Quiz answers. enter your last known logo name and we will show you the answers :) View all answers Level 1 Level 2 Level 3 Level 14 Level 15 Level 15 Level 15 Level 14 Level 15 Le Quiz Logo game answers page, the most addictive game for android, iPhone and iPad. 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Overview See also: Android software development of Android started in 2003 by Android, Inc., which was purchased by Google in 2005.[1] There were at least two internal releases of the software inside Google and the Open Handset Alliance (OHA) before the beta version was released.[2][3] The beta was released on November 5, 2007,[4][5] while the software development kit (SDK) was released on November 12, 2007.[6] Several public beta versions of the SDK were released.[7] These released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Several public beta versions of the SDK were released on November 12, 2007.[6] Sev occurred with the release of the T-Mobile G1 (aka HTC Dream) in October 2008.[8] Android 1.0 and 1.1 releases of the early pre-1.0 milestone builds and were never used as the actual code names of the 1.0 and 1.1 releases of the OS [10] The project manager, Ryan Gibson, conceived using a confectionery-themed naming scheme for public releases, starting with Android 1.5 Cupcake. Google announced in August 2019 they were ending the confectionery theming scheme to use numerical ordering for future versions.[11] The first release under the numerical order format was Android 10, which was released September 2019. In 2017, Google announced
that Google Play would begin to require apps to target a recent Android version.[12] The current target API level that new apps and app updates must target is Android 11 (API level 30).[13] New apps must target API level 31) in August 2022. App updates will be required to target API level 31 in November 2022. Name Internal codename[9] Version number(s) APIlevel Initial stablerelease date Latest security patch date[14] Latest Google Play Services version[15](release date) Android 1.0 - Old version, no longer maintained: 1.0 1 September 23, 2008 - Android 1.1 Petit Four Old version, no longer maintained: 1.1 2 February 9, 2009 Android Cupcake Cupcake Old version, no longer maintained: 2.0.5 October 27, 2009 Android Eclair Eclair Old version, no longer maintained: 2.0.1 6 December 3, 2009 Old version, no longer maintained: 2.1 7 January 11, 2010[16] Android Froyo Froyo Old version, no longer maintained: 2.2 - 2.2.3 8 May 20, 2010 3.2.25 (October 2014) Android Gingerbread Old version, no longer maintained: 2.3 - 2.3.7 10 February 9, 2011 Android Honeycomb Honeycomb Old version, no longer maintained: 3.0 11 February 22, 2011 Old version, no longer maintained: 3.1 12 May 10, 2011 Old version, no longer maintained: 3.2 - 3.2.6 13 July 15, 2011 Android Ice Cream Sandwich Ice Cream 14.8.49 (February 2019) Old version, no longer maintained: 4.0.3 - 4.0.4 15 December 16, 2011 Android Jelly Bean Jelly Be Android KitKat Key Lime Pie Old version, no longer maintained: 4.4 - 4.4.4 19 October 31, 2013 October 2017 22.26.15 (July 2022) Old version, no longer maintained: 5.0 - 5.0.2 21 November 4, 2014[17] November 2017 Old version, no longer maintained: 4.4W - 4.4W.2 20 June 25, 2014 ? 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Android Lollipop Lemon Meringue Pie Old version, no longer maintained: 4.4W - 4.4W.2 20 June 25, 201 maintained: 5.1 - 5.1.1 22 March 2, 2015[18] March 2018 Android Marshmallow Macadamia Nut Cookie Old version, no longer maintained: 7.1 - 7.1.2 25 August 22, 2016 August 22, 2016 August 2019 Old version, no longer maintained: 7.1 - 7.1.2 25 October 4, 2016 October 2019 Android Oreo Oatmeal Cookie Old version, no longer maintained: 8.0 26 August 21, 2017 January 2021 Old version, no longer maintained: 8.1 27 December 5, 2017 October 2021 Android 10 Quince Tart[21] Older version, yet still maintained: 10 29 September 3, 2019 August 2022 Android 11 Red Velvet Cake[21] Older version, yet still maintained: 12 31 October 4, 2021 Android 12L Snow Cone v2 Older version, yet still maintained: 12.1[a] 32 March 7, 2022 Android 13 Tiramisu[23] Current stable version: 13 33 August 15, 2022 Legend:Old versionOlder version history The following tables show the release dates and key features of all Android operating system updates to date, listed chronologically by their official application programming interface (API) levels. Android 1.0 (API 1) Android 1.0, the first commercial version of the software, was released on September 23, 2008. [24] The first commercial version Release date Features 1.0 September 23, 2008 Android Market allowing application downloads and updates through the Market application. Web browser to show, zoom and pan full HTML and XHTML web pages - multiple pages show as windows ("cards").[26][27] Camera support - however, this version lacked the option to change the camera's resolution, white balance, quality, etc.[28] Folders allowing the grouping of a number of application icons into a single folder icon on the Home screen. [29] Access to web email servers, supporting POP3, IMAP4, and SMTP. [27] Gmail synchronization with the Calendar application. Google Contacts synchronization with the Gmail application. Maps with Street View to view maps and satellite imagery, as well as find local businesses and obtain driving directions using GPS.[28] Google Search, allowing users to search the Internet and phone applications, contacts, calendar, etc. Google Talk instant messaging. Instant messaging, text messaging, and MMS. Media Player, enabling management, importing, and playback of media files - however, this version lacked video and stereo Bluetooth support. [27][28] Notifications appear in the Status bar, with options to set ringtone, LED or vibration alerts. [26][27][30] Voice Dialer allows dialing and placing of phone calls without typing a name or number.[27] Wallpaper allows the user to set the background image or photo behind the Home screen (Launcher), Pictures (Gallery), and Settings. Wi-Fi and Bluetooth support. Android 1.1 (API 2) On February 9, 2009, the Android 1.1 update was not used officially.[10][32] The update resolved bugs, changed the Android API and added a number of features:[33] Version Release date Features 1.1 February 9, 2009 Details and reviews available when a user searches for businesses on Maps. Longer in-call screen timeout by default when using the speakerphone, plus the ability to show/hide the dialpad. Ability to save attachments in messages. Support added for marquee in system layouts. Android 1.5 Cupcake An (API 3) On April 27, 2009, the Android 1.5 update was released, based on a dessert item ("Cupcake"), a theme used for all releases until Android 10 using a number-only system. The update included several new features and UI amendments: [36] Version Release date Features Image(s) 1.5 April 27, 2009[34] Support for third-party virtual keyboards with text prediction and a user dictionary for custom words. Support for third-party virtual keyboards with text prediction and a user dictionary for custom words. playback in MPEG-4 and 3GP formats. Auto-pairing and stereo support for Bluetooth (A2DP and AVRCP profiles). Copy and paste features in web browser. User pictures shown for events in call log, and one-touch access to a contact card from a call log event. Animated screen transitions. Autorotation option. New stock boot animation. Ability to upload videos to YouTube. Ability to upload photos to Picasa. Ability to check phone usage history.[38] Android 1.6 Donut (API 4) On September 15, 2009, Android 1.6 Donut (API 4) the update were numerous new features:[39] Version Release date Features Image(s) 1.6 September 15, 2009[40] Voice and text entry search enhanced to include their content in search results. Multi-lingual speech synthesis engine to allow any Android application to "speak" a string of text. Easier searching and the ability to view app screenshots in Android Market. Gallery, Camera and camcorder more fully integrated, with faster camera access. Ability for users to select multiple photos
for deletion. Updated technology support for CDMA/EVDO, 802.1x, VPNs, and a text-to-speech engine. Support for WVGA screen resolutions. Speed improvements in searching and camera applications. Expanded Gesture framework and a new GestureBuilder development tool. Android 2.0 Eclair (API 5) On October 27, 2009, the Android 2.0 Eclair (API 5) On Octo the ones listed below.[43] Version Release date Features Image(s) 2.0 October 27, 2009[44] Expanded Accounts in one page. Bluetooth 2.1 support, with a combined inbox to browse an email from multiple accounts in one page. Bluetooth 2.1 support. Ability to tap a Contacts photo and select to call, SMS, or email the person. Ability to search all saved SMS and MMS messages, with the added ability to delete the oldest messages, with the added ability to delete the oldest messages, with the added ability to delete the oldest messages. color effect and macro focus. Improved typing speed on a virtual keyboard, with a smarter dictionary that learns from word usage and includes contact names as suggestions. Refreshed browser UI with bookmark thumbnails, double-tap zoom and support for HTML5. Calendar agenda view enhanced, showing attending status for each invitee, and the ability to invite new guests to events. Optimized hardware speed and revamped UI. Support for more screen sizes and resolutions, with better contrast ratio. Improved Google Maps 3.1.2. MotionEvent class enhanced to track multi-touch events.[45] Pressure-sensitive touch support in API, even though no according hardware existed at that time.[46] [47] Addition of live wallpapers, allowing the animation of home-screen background images to show movement. Android 2.0.1 Eclair Android 2.0.1 Eclair (API 6) Version Release date Features Image(s) 2.0.1 December 3, 2009[48] Minor API changes, bug fixes and framework behavioral changes. Android 2.1 Eclair (API 7) Version Release date Features Image(s) 2.1 January 11, 2010[49][16] Minor amendments to the API and bug fixes. Android 2.2 Froyo (API 8) On May 20, 2010, the SDK for Android 2.2 (Froyo, short for frozen yogurt) was released, based on Linux kernel 2.6.32.[50] Version Release date Features Image(s) 2.2 May 20, 2010 Speed, memory, and performance optimizations.[51] Additional application speed improvements, implemented through JIT compilation.[52] Integration of Chrome's V8 JavaScript engine into the Browser application. Support for the Android Cloud to Device Messaging (C2DM) service, enabling push notifications. Improved Microsoft Exchange support, including security policies, auto-discovery, GAL look-up, calendar synchronization and remote wipe.[53] Improved applications. USB tethering and Wi-Fi hotspot functionality[54] Option to disable data access over a mobile network. Updated Market application with batch and automatic update features.[51] Quick switching between multiple keyboard languages and their dictionaries. Support for Bluetooth-enabled car and desk docks. Support for file upload fields in the Browser application.[55] The browser now shows all frames of animated GIFs instead of just the first frame only. Support for installing applications to expandable memory. Adobe Flash support.[56] Support for high-PPI displays (up to 320 ppi), such as four-inch 720p screens.[57] Gallery allows users to view picture stacks using a zoom gesture. Android 2.2 home screen 2.2.1 September 27, 2010[58] Bug fixes, security updates and performance improvements. 2.2.2 January 21, 2011[59] Minor bug fixes, including SMS routing issues that affected the Nexus One.[60] 2.2.3 November 21, 2011[61] Two security updates. Android 2.3 Gingerbread (API 9) On December 6, 2010, the Android 2.3 Gingerbread (SDK was released, based on Linux kernel 2.6.35.[62][63] Changes included:[62] Version Release date Features Image(s) 2.3 December 6, 2010[63] Updated user interface design with increased simplicity and higher).[57] Native support for SIP VoIP internet telephones. Faster, more intuitive text input on a virtual keyboard, with improved accuracy, better suggested text and voice input mode. Enhanced copy/paste functionality, allowing users to select a word by press-holding, copying, and pasting. Support for Near Field Communication (NFC), allowing the user to read an NFC tag embedded in a poster, sticker, or advertisement. New audio effects such as reverb, equalization, headphone virtualization, and bass boost. New Download Manager, giving users easy access to any file downloaded from the browser, email, or another application. Support for multiple cameras on the device, including a front-facing camera, if available. Support for multiple cameras on the device, including a front-facing camera, if available. management with a more active role in managing applications that are keeping the device awake for too long. Enhanced support for native code development. Switched from YAFFS to ext4 on newer devices.[64][65] Audio, graphical, and input enhancements for game development. support for more sensors (such as gyroscopes and barometers). First Android version to feature an Easter egg. It was an image of the Bugdroid standing next to a zombie gingerbread man, with many more zombies in the background. Android 2.3 home screen 2.3.1 December 22, 2010[66] Improvements and bug fixes for the Nexus S. 2.3.2 January 21 2011[67] Improvements and bug fixes for the Nexus S. Android 2.3.3 Gingerbread Android 2.3.3 Gingerbread (API 10) Version Release date Features Image(s) 2.3.4 April 28, 2011[70] Support for voice or video chat using Google Talk.[71] Open Accessory Library support. Open Accessory was introduced in 3.1 (Honeycomb) but the Open Accessory Library grants 2.3.4 added support when connecting to a USB peripheral with compatible software and a compa Plus. 2.3.5 July 25, 2011[75] Improved network performance for the Nexus S 4G, among other fixes and improved battery efficiency. Shadow animations for list scrolling. Camera software enhancements.[76] Improved battery efficiency. 2.3.6 September 2, 2011[77] Fixed a voice search bug.[b] 2.3.7 September 21, 2011 Google Wallet support for the Nexus S 4G. Android 3.0 Honeycomb (API 11) On February 22, 2011, the Android 3.0 Honeycomb (API 11) On Februar first device featuring this version, the Motorola Xoom tablet, was released on February 24, 2011.[82] Optimized tablet support
with a new "holographic" user interface (removed again the following year with version 4.2).[85] New Easter egg, an image of a Tron-themed bumblebee. Added System Bar, featuring quick access to notifications, status, and soft navigation, widgets, or other types of contextual options, navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, or other types of contextual optications, status, and soft navigation, widgets, and soft navigat in the System Bar allows users to see snapshots of the tasks underway and quickly jump from one application to another. Redesigned the keyboard, making typing fast, efficient and accurate on larger screen sizes Simplified, more intuitive copy/paste interface. Multiple browser tabs replacing browser windows, plus form auto-fill and a new "incognito" mode allowing somewhat anonymous browsing. Ouick access to camera exposure, focus, flash, zoom, front-facing camera, time-lapse, and other collections in full-screen mode in Gallery, with easy access to thumbnails for other photos. New two-pane Contacts UI and Fast Scroll to let users easily organize and locate contacts. New two-pane Email UI to make viewing and organizing messages more efficient, allowing users to select one or more messages. Hardware acceleration. Support for multi-core processors. Ability to encrypt all user data. HTTPS stack improved with Server Name Indication (SNI). Filesystem in Userspace (FUSE; kernel module). Disallows applications from having to write access to secondary storage (memory cards on devices with internal storage is still allowed through a separate application-level permission.[86][87] Android 3.0 home screen Android 3.1 Honeycomb Android 3.1 Honeycomb (API 12) Version Release date Features Image(s) 3.1 May 10, 2011[88] UI refinements. Connectivity for USB accessories (USB On-The-Go). Expanded Recent Applications list. Resizable Home screen widgets. Support for external keyboards and pointing devices. support, including optimizations for a wider range of tablets. Increased ability of applications to access files on the SD card, e.g. for synchronization. Compatibility display mode for applications that have not been optimized for tablet screen resolutions. New display support functions, giving developers more control over display appearance on different Android devices.[92] 3.2.1 September 20, 2011 Bug fixes and minor security, stability and Wi-Fi improvements. Update to Google Books. Improved Adobe Flash support in browser. Improved Chinese handwriting prediction. 3.2.2 September 30, 2011 Bug fixes and other minor improvements for the Motorola Xoom 4G. 3.2.4 December 15, 2011 Pay As You Go for 3G and 4G tablets. 3.2.6 February 15, 2012 Fixed data connectivity issues when coming out of Airplane mode on the US 4G Motorola Xoom. Android 4.0 Ice Cream Sandwich (API 14) The SDK for Android 4.0.1 (Ice Cream Sandwich), based on Linux kernel 3.0.1,[93] was publicly released on October 19, 2011.[94] Google's Gabe Cohen stated that time.[95] The source code for Android 4.0 became available on November 14, 2011.[96] Ice Cream Sandwich was the last version to officially support Adobe Systems' Flash player.[97] The update introduced numerous new features:[98][99][100] Version Release date Features introduced numerous new features:[98][99][100] Version Release date F phones. Separation of widgets in a new tab, listed in a similar manner to applications. Easier-to-create folders, with a drag-and-drop style. Improved visual voicemail messages. Pinch-to-zoom functionality in the Calendar. Integrated screenshot capture (accomplished by holding down the Power and Volume-Down buttons). Improved error correction on the keyboard. Ability to access applications directly from the lock screen. Improved copy-and-paste functionality. Better voice integration and continuous, real-time speech-to-text dictation. Face Unlock, a feature that allows users to unlock handsets using facial recognition software.[85] Automatic syncing of browser with users' Chrome bookmarks. Data Usage section in settings that lets users set warnings when the limit is exceeded. Ability to shut down applications from the recent apps list with a swipe.[101] Improved camera application with zero shutter lag, time lapse settings panorama mode, and the ability to zoom while recording. Built-in photo editor. New gallery layout, organized by location and person. Refreshed the "People" application with social network integration, status updates and hi-res images. Android Beam, a near-field communication feature allowing the rapid short-range exchange of web bookmarks contact info, directions, YouTube videos and other data.[85] Support for the WebP image format.[89] Hardware acceleration of the UI.[102] Wi-Fi Direct.[103] 1080p video recording for stock Android devices. Android devices. Android devices. Android devices. Android 4.0 home screen 4.0.1 October 19, 2011 Fixed minor bugs for the Samsung Galaxy Nexus, the US launch of which was later delayed until December 2011.[c] Android 4.0.3 Ice Cream Sandwich (API 15) Version Release date Features Image(s) 4.0.3 December 16, 2011[106] Numerous bug fixes and optimizations. Improvements to graphics, databases, spell-checking and Bluetooth functionality. New APIs for developers, including a social stream API in the Contacts provider. resolution. Accessibility refinements such as improved content access for screen readers. [107] 4.0.4 March 28, 2012 Stability improvements. Better camera performance. Smoother screen rotation. Improved phone number recognition. [108] Android 4.1 Jelly Bean (API 16) Google announced Android 4.1 Jelly Bean) at the Google announced Android 4.1 Jelly Bean (API 16) Google announced Android 4.1 Jelly Bean) at the Google announced Android 4.1 Jelly Bean (API 16) Google announced Android 4.1 Jelly Bean (API 16) Google announced Android 4.1 Jelly Bean) at the Google announced Android 4.1 Jelly Bean (API 16) Google announced A I/O conference on June 27, 2012. Based on Linux kernel 3.0.31, Jelly Bean was an incremental update with the primary aim of improvement involved "Project Butter", which uses touch anticipation, triple buffering, extended vsync timing and a fixed frame rate of 60 fps to create a fluid and "buttery-smooth" UI.[109] Android 4.1 Jelly Bean, was released to the Android Open Source Project on July 9, 2012, [110] and the Nexus 7 tablet, the first device to run Jelly Bean, was released to the Android Open Source Project on July 9, 2012. Version Release date Features Image(s) 4.1 July 9, 2012 Smoother user interface: Vsync timing across all drawing and animation done by the Android framework, including application rendering, touch events, screen composition and display refresh. Triple buffering in the graphics pipeline. CPU input boost. Synchronizing touch to vsync timing. Enhanced accessibility. Bi-directional text and other language support. User-installable keyboard maps. Expandable notifications. TLS v1.1 and v1.2 support added. Ability to turn off notifications on an application-specific basis. Shortcuts and widgets can automatically be re-arranged or re-sized to allow new items to fit on home screens. Bluetooth data transfer for Android Beam. Tablets with smaller screens now use an expanded version of the interface layout and home screen used by phones.[111] Improved camera application. Multichannel audio.[109] The Fraunhofer FDK AAC codec becomes standard in Android, adding AAC 5.1 channel encoding/decoding. USB audio (for external sound DACs).[109] Audio chaining (also known as gapless playback).[109][112][113] Ability for other launchers to add widgets from the application drawer without requiring root access. Android 4.1 home screen vitations. [117] Bug fixes and performance enhancements. Android 4.2 Jelly Bean Android 4.2 Jelly Bean (API 17) Google was expected to announce Jelly Bean 4.2 at an event in New York City on October 29, 2012, but the event was cancelled due to Hurricane Sandy.[118] Instead of rescheduling the live event, Google announced the new version with a press release, under the slogan "A new flavor of Jelly Bean". Jelly Bean 4.2 was based on Linux kernel 3.4.0, and debuted on Google's Nexus 4 and Nexus 10, which were released date Features 4.2 November 13, 2012[121] Lock screen improvements, including widget support (removed again in 2014)[85] and the ability to swipe directly to the camera.[122] Notification power controls ("Quick Settings"). "Daydream" screen saver" following the launch of the unrelated Google Daydream VR platform in 2016).[85] Multiple user accounts (tablets only). Rewritten Bluetooth stack, switching from Bluez to Broadcom open source BlueDroid, [123] allowing improved support for multiple displays and
wireless display (Miracast). Native right-to-left, always-on VPN and application verification. [124] A new NFC stack was added at the same time. [123] Accessibility improvements: triple-tap to magnify the entire screen, pan and zoom with two fingers. Speech output and Gesture Mode navigation for blind users. New clock application with a built-in world clock, stop watch and timer. All devices now use the same interface layout, previously adapted from phones on 4.1 for smaller tablets (with centered software buttons, the system bar at the top of the screen, and a home screen with a dock and centered application menu), regardless of screen size. Increased number of extended notifications and Actionable Notifications for more application bar and without launching the application directly. SELinux support. Premium SMS confirmation.[125] Group Messaging support. 4.2.1 November 27, 2012[126][127] Fixed a bug in the People application where December was not displayed on the date selector when adding an event to a contact.[128] Added Bluetooth gamepads and joysticks as supported HIDs (Human interface devices). 4.2.2 February 11, 2013[129] Fixed Bluetooth audio streaming bugs.[130] Longpressing the Wi-Fi and Bluetooth icons in Quick Settings now toggles the on/off state. New download notifications, which now show the percentage and estimated time remaining for active application downloads. New sounds for wireless charging and low battery. New Gallery application animation allows faster loading. USB debug whitelist. Bug fixes and performance enhancements. Android 4.3 Jelly Bean (API 18) Google released Jelly Bean (API 18) Google released Jelly Bean "An even sweeter Jelly Bean "An even sweeter Jelly Bean" on July 24, 2013, during an event in San Francisco called "Breakfast with Sundar Pichai". 7 tablet was the first device to officially ship with it.[131] A minor bug fix update was released on August 22, 2013.[132] Version Release date Features 4.3 July 24, 2013.[132] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [134] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [135] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [135] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [137] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [136] Bluetooth Audio/Video Remote Control Profile (AVRCP) 1.3 support. [1 Restricted access mode for new user profiles.[134] Filesystem performance improvement by running the fstrim command while a device is idle.[135] Dial pad auto-complete in the Phone application.[134] Volume for incoming calls (ringtone) and notification alerts is no longer adjustable separately. Improvements to Photo Sphere.[136] Reworked camera UI, previously introduced on Google Play edition phones.[137] Addition of "App Ops", a fine-grained application permissions control system (hidden by default).[138] SELinux enabled by default. 4K resolution support.[139] Numerous security updates, performance enhancements, and bug fixes.[140] System-level support for geofencing and Wi-Fi scanning APIs. Background Wi-Fi location still runs even when Wi-Fi is turned off. Developer logging and analyzing enhancements. Added support for five more languages. Changed digital rights management (DRM) APIs. Right-to-left (RTL) languages now supported.[134] Clock in the status bar disappears if it is selected as a lockscreen widget. Native emoji support.[141] 4.3.1 October 3, 2013[142] Bug fixes and small tweaks for the Nexus 7 LTE.[143] Android 4.4 KitKat (API 19) Google announced Android 4.4 KitKat on September 3, 2013. Although initially under the "Key Lime Pie" ("KLP") codename, the name was changed because "very few people actually know the taste of a key lime pie."[144] Some technology bloggers also expected the "Key Lime Pie" release to be Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5 on October 31, 2013, and was optimized to run on a greater range of devices than earlier Android 5.[145] KitKat debuted on Google's Nexus 5.[145] K as "Project Svelte" internally at Google.[146] The required minimum amount of RAM available to Android is 340 MB, and all devices with less than 512 MB of RAM must report themselves as "low RAM" devices.[147] Version Release date Features Image(s) 4.4 October 31, 2013[148][149] Refreshed interface with white elements instead of blue. Clock no longer shows bold hours; all digits are thin. The H, M, and S markings for the stopwatch and timer have been removed, leaving just the numbers. Ability for applications to trigger translucency in the navigation and status bars. [150] Ability for applications to trigger translucency in the navigation and status bars. user interaction.[151] Action overflow menu buttons are always visible, even on devices with a "Menu" key, which was officially deprecated by Android 4.0.[152] Write access disabled for user-installed applications on external storage (i.e. MicroSD), except for their own directories inside Android/data.[153][154] Purging of app data directories in user-installed applications on external storage (i.e. MicroSD), except for their own directories inside Android/data.[153][154] Purging of app data directories in user-installed applications on external storage (i.e. MicroSD), except for their own directories inside Android/data.[153][154] Purging of app data directories in user-installed applications on external storage (i.e. MicroSD), except for their own directories inside Android/data.[153][154] Purging of app data directories in user-installed applications on external storage (i.e. MicroSD), except for their own directories inside Android/data.[153][154] Purging of app data directories in user-installed applications on external storage (i.e. MicroSD), except for their own directories inside Android/data.[153][154] Purging of app data directories in user-installed applications on external storage (i.e. MicroSD), except for their own directories inside Android/data.[153][154] Purging of app data directories in user-installed applications on external storage (i.e. MicroSD), except for their own directories inside Android/data.[153][154] Purging of app data directories in user-installed applications on external storage (i.e. MicroSD), except for their own directories in user-installed applications on external storage (i.e. MicroSD). storage (internal user storage and MicroSD) upon uninstallation[154] Optimizations for performance on devices with lower specifications, including zRAM support and "low RAM" device API.[146] Wireless printing capability.[146] NFC host card emulation, enabling a device to replace smart cards.[146] WebViews are now based on the Chromium engine (feature parity with Chrome for Android 30). Expanded functionality for notification listener services.[146] Public API for developing and managing text messaging clients.[155] Storage Access Framework, an API allowing apps to retrieve files in a consistent manner. As part of the
framework, an API allowing apps to retrieve files in a consistent manner. from various sources (including those exposed by apps, such as online storage services).[86] New framework for UI transitions. Sensor batching, step detector and counter APIs.[146] Settings application. Audio tunneling, audio monitoring and loudness enhancer.[156] Built-in screen recording feature (primarily for developers, as usage of ADB is required).[157] Native infrared blaster API. Verified boot. Enforcing SELinux. Expanded accessibility APIs and system-level closed captioning settings. Android Runtime (ART) introduced as a new experimental application runtime environment, not enabled by default, as a replacement for the Dalvik virtual machine.[158] Bluetooth Message Access Profile (MAP) support.[159] Disabled access to battery statistics by third-party applications.[160] Settings application no longer uses a multi-pane layout on devices with larger screens. Wi-Fi and mobile data activity (TX/RX) indicators are moved to quick settings.[161] Disables text wrapping in the WebView browser component.[162] Android 4.4 home screen 4.4.1 December 5, 2013[163][164] Better application now loads Google+ Photos instead of Gallery when swiping away from the camera view. Miscellaneous improvements and bug fixes. 4.4.2 December 9, 2013[165] Further security enhancements and bug fixes. Removal of the "App Ops" application permissions control system, introduced in Android 4.3.[166] 4.4.3 June 2, 2014[167][168] Refreshed the Dialer app's interface.[169] Updated the Chromium-based WebView to version 33 (screencasting to DevTools, HTML5 Canvas hardware acceleration performance improvements, vibration API, HTML5 form validation, and an HTML5 datalist).[170] Miscellaneous improvements and bug fixes. 4.4.4 June 19, 2014[171] CVE-2014-0224 fixed, eliminating an OpenSSL man-in-the-middle vulnerability.[172] Android 4.4W KitKat, with wearable extensions Android 4.4W KitKat, with wearable extensions (API 20) On June 24, 2014, a version of Android KitKat exclusive to Android Wear platform for smartwatches: the same as Android 4.4 "KitKat", but with wearable extensions added. 4.4W.1 September 6, 2014[175] UI updates for Google Maps navigation and alarms. 4.4W.2 October 21, 2014[176] Offline music playback. GPS support. Android 5.0 Lollipop "was unveiled under the codename "Android 5.0 Lollipop" was unve the-air (OTA) update on November 12, 2014, for select devices that run distributions of Android serviced by Google, including Nexus and Google Play edition devices. Its source code was made available on November 3, 2014.[177][178] Lollipop features a redesigned user interface built around a responsive design language referred to as "material design". Other changes include improvements to the notifications, which can be accessed from the lockscreen and displayed within application performance, and with changes to the platform, with the Android Runtime (ART) officially replacing Dalvik for improved applications as top-of-the-screen banners. intended to improve and optimize battery usage, known internally as Project Volta.[179][180][181][182] Version Release date Features Image(s) 5.0[183] November 4, 2014[17] Android Runtime (ART) with ahead-of-time (AOT) compilation and improved garbage collection (GC), replacing Dalvik that combines bytecode interpretation with trace-based just-in-time (JIT) compilation.[183][184] Support for 64-bit CPUs. OpenGL ES 3.1 and Android Extension Pack (AEP) on supported GPU configurations. Recent activities screen with tasks instead of applications. Material design, bringing a restyled user interface and "ripple effect" for buttons. Refreshed lock screen, no longer supporting widgets. [185] Refreshed notification tray and quick settings for quicker access to particular settings. Lock screen provides shortcuts to application and notification settings.[186] Guest logins and multiple user accounts are available on more devices, such as phones.[187] Audio input and output through USB devices. Third-party applications regain the ability to read and modify data located anywhere on external storage, such as phones.[187] Audio input and output through USB devices. be adapted to the storage access framework of Android API level 21 or higher.[188] [189] Pinning of an application's screen for restricted user activity.[186] Recently used applications are remembered even after restarting the device.[186] WebViews receive updates independently through Google Play for security reasons, instead of relying on systemwide vendor updates.[190] Addition of 15 new languages: Basque, Bengali, Burmese, Chinese (Hong Kong), Galician, Icelandic, Kannada, Kyrgyz, Macedonian, Malayalam, Marathi, Nepali, Sinhala, Tamil and Telugu.[191] Tap and Go allows users to quickly migrate to a new Android device, using NFC and Bluetooth to transfer Google Account details, configuration settings, user data and installed applications.[186] A flashlight-style application is included, working on support (e.grand for all domains. [192] Smart lock feature.[193] SELinux in enforcing mode for all domains. Updated emoji.[194] Improved accessibility support (e.grand for all domains. [192] Smart lock feature.[193] SELinux in enforcing mode for all domains. [194] Improved accessibility support (e.grand for all domains. [194] Improved accessibilit switch access support).[195] Block-based over-the-air (OTA) updates for new devices.[196] Task listing access disabled for third-party applications. Android 5.0 home screen 5.0.1 December 2, 2014[197] A few bug fixes, including resolving issues with video playback and password failures handling. 5.0.2 December 19, 2014[22] Fixes a bug with TRIM. support (introduced in Version 4.3), which prevented devices from running on-charger cleanups of file system allocations if the device was turned off at midnight, or if it was charged only when in use.[198] Changes how alarms wake the CPU, and how alarms compete for system resources.[199] Android 5.1 Lollipop (API 22) Version Release date Features Image(s) 5.1 March 2, 2015[18] Improvements and bug fixes to the Overview screen. Ability to join Wi-Fi networks and control paired Bluetooth devices from quick settings. Official support for multiple SIM cards.[200] Device protection: if a device is lost or stolen it will remain locked until the owner signs into their Google account, even if the device is reset to factory settings. High-definition voice calls, available between compatible 4G LTE devices running Android 5.0.[201] 5.1.1 April 20, 2015[202][203] Various bug fixes[203] Native Wi-Fi calling support.[204] Android 6.0 Marshmallow (API 23) Android 6.0 Marshmallow (API 23) Android 6.0 "Marshmallow" was unveiled under the codename "Android 6.0 Marshmallow" was u preview (MPA44G) was released on August 17, 2015 for the Nexus 5, Nexus 6, Nexus 9 and Nexus Player devices, [206] and was updated to MPA44I that brought fixes related to Android for Work profiles. [207] Version Release date Features Image(s) 6.0 October 2, 2015[19][208] Precluded rudimentary file manager (package name com.android.documentsui), accessible from storage settings.[210] Memory card mounted to /storage/extSdCard/, with a hexadecimal volume serial number in place of the wildcard the question marks.[210] Contextual search from keywords within apps.[211] Introduction of Doze mode, which reduces CPU speed while the screen is off in order to save battery life.[212] App Standby feature. Alphabetically accessible vertical application drawer.[213] Application drawer.[213] Application search bar and favorites. Native fingerprint reader support. Direct Share feature for faster instinctive opening of links with corresponding applications.[215][216] Larger Application folders with multiple pages. Post-install/run-time permission requests. USB-C support. Demo Mode feature for screenshot-capture usage.[217] Automatic full data backup and restore for apps.[218] 4K display mode for apps.[219] Adoptable External storage to behave like Internal Storage.[220][221] MIDI support for musical instruments.[222] Experimental multi-window feature.[223][224] Support for actions by third-party apps in the text selection menu.[85] App permissions now granted individually at run-time, not all-or-nothing at install time. Similar to App Ops.[225] Miracast support dropped.[85] Many new essential commands supported by Android 5.0 home screen 6.0.1 December 7, 2015[226] Unicode 7.0 & 8.0 emoji support.[227] Descriptions for USB connection options. Double-press the power button to open the camera. Android 7.0 Nougat Android 7.0 Nougat (API 24) Android "Nougat" (codenamed N in-development) is the seventh major release of the Android operating system. It was first released as a developer preview on March 9, 2016, with factory images for supported directly to the Android Nougat beta via an over-the-air update. The final release was on August 22, 2016. The final preview build was released on July 18, 2016, [228] with the build number NPD90G. Version Release date Features Image(s) 7.0 August 22, 2016[229] Support for file-based encryption. [230] Unicode 9.0 emoji and skin tone modifier support (and exposes a subset of ICU4J APIs).[231] Ability to display color calibration. Ability to zoom in the screen. Ability to switch to the last opened app by double-tapping the overview button. Added the "Clear All" button to the last opened app by double-tapping the overview button. system updates. Daydream virtual reality platform (VR interface). Improved Doze functionality, which aims to prolong battery life. Improvements to the file browser. Ability to move files added to Storage Access Framework[232] More Quick Settings options. Multi-window support, which supports floating apps on a desktop layout. New Data Saver mode, which can force apps to reduce bandwidth usage. New JIT Compiler, making for 75 percent faster app installations and a 50 percent reduction in compiled code
size. Just in Time (JIT) compiler with code profiling to ART, which lets it constantly improve the performance of Android apps as they run.[233] Picture-in-picture support for Android TV. Redesigned notification shade, featuring instant access to certain settings. Redesigned Overview screen. Replaced notification cards with notification cards with notification shade, featuring instant access[236] Android 7.0 home available of the system access[236] Android 7.0 home available o screen Android 7.1 Nougat Android 7.1 Nougat (API 25) On October 19, 2016, Google released Android 7.1.1 as a developer preview for the Nexus 5X, Nexus 6P and the Pixel C. A second preview for the Nexus 5X, Nexus 6P and the Nexus 5X, Nexus 6P an 7.1 October 4, 2016[237] Rearranged notification shade. "Restart" option added to power button menu[238] Touch/display performance improvements. Moves (Fingerprint swipe down gesture - opt-in). Opt-in with new hardware required: Seamless A/B system updates. Daydream VR mode. Developer features: Shortcut manager APIs. Circular app icons support. Keyboard image insertion. Fingerprint sensor gesture to open/close notification shade. Manual storage manager Intent for apps. Improved VR thread scheduling. Enhanced wallpaper metadata. Multi-endpoint call support for Visual Voicemail Carrier config options for managing telephone videos. Manual storage manager - identifies files and apps using storage. Android 7.1 home screen 7.1.1[239] December 1, 2016[240] New set of emojis adding different skin tones and haircuts to existing ones. Send GIFs directly from the default keyboard. App shortcuts: Launch actions on apps by longpressing the app icon. Developer Options: Show CPU Usage feature removed. 7.1.2[241][242] April 2, 2017[243] Battery usage alerts. Android 8.0 Oreo (API 26) Android 0.0 Oreo (API 26) Android 0.0 Oreo is the eighth major release of the Android operating system. It was first released as a developer preview, codenamed Android 0, on March 21, 2017, with factory images for supported Nexus and Pixel devices. The final developer preview was released on July 24, 2017, with the stable version released in August 21, 2017 Project Treble, the biggest change to the foundations of Android to date: a modular architecture that makes it easier and faster for hardware makers to deliver Android updates. Picture-in-picture support. Support for Unicode 10.0 emoji (5.0) and replacement of all blob-shaped emojis by round ones with gradients and outlines. Redesigned Quick Settings by round ones with gradients and settings with a white background and respectively black and Accent font colors. Restructured Settings by regrouping sections into similar entries. Adaptive icons Notification channels. Notification dots (badges). Notification shade multi-colors (for music album art, messengers, etc.). System-wide Autofill framework. Support for AAC, Sony's LDAC and Qualcomm's aptX and aptX HD codecs. [245] App support. 2 times faster boot time compared to Nougat according to Google, testing on their Pixel devices, [244] Apps background execution and location limits. Google Play Protect, Downloadable fonts, Integrated printing support. Color management (deep color gamut), Wi-Fi Assistant ecific unknown sources. Multi-aisi Android 8.0 home screen Android 8.1 Oreo (API 27) Android 8.1 Oreo is the sixteenth minor release of the Android operating system. It was first released as a developer preview was made available on November 27, 2017, for Nexus and Pixel devices, before the stable version was released on December 5, 2017. Version Release date Features Image(s) 8.1[246][247] December 5, 2017[248][247] December 5, 2017[2 distribution of Android that runs better than normal Android on devices with less than 1 GB of RAM.[250] Autofill framework updates. Programmatic Safe Browsing actions. Navigation buttons dim when not in use. Visual changes to 'Power Off' and 'Restart', including a new screen and floating toolbar. Toast messages are now white with the same existing transparency. Automatic light and dark themes. New Easter egg in the form of an official Oreo cookie picture. [251] Android 9 Pie (API 28) Android 9 Pi released on the same day. The second preview, considered beta guality, was released on May 8, 2018. The final beta of Android Pie (fifth preview, also considered as a "Release don July 25, 2018. The first official release don July 25, 2018. interface for the quick settings menu.[252] The clock has moved to the left of the notification bar.[253] The "dock" now has a semi-transparent background.[253] A new "Lockdown" mode which disables biometric authentication once activated. Rounded corners across the UI. New transitions for switching between apps, or activities within a notification, full-scale images, and smart replies akin to Google's new app, Reply. Support for display cutouts. Redesigned volume slider. Battery percentage now shown in Always-On Display. Lock screen security changes include the possible return of an improved NFC Unlock. Experimental features (which are currently hidden within a menu called Feature Flags) such as a redesigned About Phone page in settings, and automatic Bluetooth enabling while driving. DNS over TLS.[254] A new optional gesture-based system interface, allowing users to navigate the OS using swipes more often than the traditional UI. Redesigned multitask app switcher with the Google search bar and app drawer built-in. Android Dashboard, which tells the user how much time they are spending on their device and in apps, and allows the user to set time limits on apps. "Shush", an enhanced version of Do Not Disturb mode activated by placing the phone face down, which makes use of Doze to hibernate user apps the OS determines the user will not use. Auto-Brightness feature modifies screen brightness based on user habits. Wind Down option lets Android 10 (API 29) Android 10 is the tenth major version of the Android operating system. The stable version of Android 10 was released on September 3, 2019. Version Release date Features Image(s) 10 September 3, 2019. to access photo, video and audio files.[260] Background apps can no longer jump into the foreground.[260] Limited access to non-resettable device identifiers.[260] Background (idle) access to camera, microphone and sensors disabled for more privacy protection with the side effect of disabling antitheft software.[261][262][263] Sharing shortcuts, which allow sharing content with a contact directly. [260] Floating settings panel, that allows changing system settings directly from apps. [260] Support for the AV1 video codec, the HDR10+ video format and the Opus audio codec. [260] Support for aptX Adaptive, LHDC, LLAC, CELT and AAC LATM codecs[264][265] A native
MIDI API, allowing interaction with music controllers. [260] Support for the WPA3 Wi-Fi security protocol. [260] Support for the WPA3 Wi-Fi security protoc theme/mode[268][269] TLS v1.3 support added. Project Mainline, allows core OS components to be updated via the Google Play Store, without requiring a complete system update[270] Android 11 (API 30) Android 11 (API 30) Android 11 is the eleventh major version of the Android 11 (API 30) Android 11 (API 30) Android 11 (API 30) Android 10 home screen Android 11 (API 30) Android 11 (API 3 on February 19, 2020, and the first developer preview released on the same day.[271][272] The launch of Android 11 Beta was postponed from June 3, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 September 8, 2020 to June 10, 2020.[273] Version Release date Features Image(s) 11 Sep standalone 5G NR and non-standalone 5G. One-time permission[274] Permissions auto-reset.[274] Wireless Android Auto on devices with 5GHz Wi-Fi.[275] Increased number of updatable core OS components in Google Play from 12 to 21.[274][276] Enterprise work profile privacy protections now apply on company-owned devices.[277] Independent left and right edge sensitivity for gesture navigation. [278] Android 11 home screen Android 12 (API 31) Android 12 is the twelfth major version of the Android 12 is the twelfth major version of the Android 12 (API 31) Android 12 is the twelfth major version of the Android 12 is the twelfth major version o Image(s) 12 October 4, 2021 Easier Wi-Fi sharing. AVIF image support. Material You, an updated design language based on Material Design. Scrolling Screenshot.[281] One Handed Mode.[282] Android Runtime (ART) module added to the updatable core OS components via Google Play, added functionality to existing modules.[283][284] Area Magnification can zoom in any content on device. [285] Extra Dim reduces brightness below minimum level. [286] Bold Text. Greyscale. Mic and Camera indicator and toggle. [citation needed] Option to choose precise or approximate location. [287] Privacy Dashboard. [287] Privacy Dashboard. [288] Gestures can work in immersive mode. [289] Performance improvements to system services to improve transitions, power efficiency, and reduce app startup times.[290] Third party app stores now have the ability to update apps without constantly asking the user for permission.[291] Android 12L (API 32) Android 12L[d] is an interim release for Android 12 that includes design tweaks for larger displays and minor stability changes to the operating system. It was announced on October 2021 alongside Beta releases with a stable version launching on March 7, 2022. Version Release date Features Image(s) 12L March 7, 2022 Improvements specific for foldable phones, tablets, desktop-sized screens and Chromebooks, and modifications to the user interface to tailor it to larger screens. [292] Android 13 (API 33) Android 13 is the thirteenth major version of the Android 13 is the thirteenth major notifications, [293] The number of active apps is now shown at the bottom of the notifications panel, a tap on it opens a detailed panel which lets the user stop each of them, [294] Support for Bluetooth LE Audio and the LC3 audio codec, [295][296][297] ART update with a new garbage collector (GC) utilizing the Linux userfaultfd system call, [298][299] [300] It reduces memory pressure, compiled code size, jank and prevents the risk of killing apps because of low memory during GC.[300] Other changes also improve app startup, reduce jank and improve performance.[300] Because of the Mainline project, Android 12 ART will also be updated.[301] Android 13 home screen with themed icons and widgets Hardware requirements See also: Android (operating system) § Hardware The main hardware platform for Android, but MIPS [f] architecture was supported and first ARMv5), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and first ARMv5), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f]
architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] and MIPS[f] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] architecture (i.e. ARMv7), with x86[e] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] architecture (i.e. ARMv8-A; previously the 32-bit ARMv7), with x86[e] architecture (i.e. ARMv7), support has since been deprecated and support was removed in NDK r17.[304] Android 1.0 through 1.5 required a 2 megapixel camera with Android 1.6.[305] In 2012, Android devices with Intel processors began to appear, including phones[306] and tablets. While gaining support for 64-bit platforms, Android was first made to run on 64-bit x86 and then on ARM64.[307][308] Since Android 5.0 Lollipop, 64-bit variants of all platforms are supported in addition to the 32-bit variants. Requirements for the minimum amount of RAM for devices running Android 7.1 depend on screen size and density and type of CPU, ranging from 816 MB-1.8 GB for 64-bit and 512 MB-1.3 GB for 32-bit meaning in practice 1 GB for the most common type of display (while minimum for Android 4.4 is to have at least 512 MB of RAM,[310] while for "low RAM" devices 340 MB is the required minimum amount that does not include memory dedicated to various hardware components such as the baseband processor.[147] Android 4.4 requires a 32-bit ARMv7, MIPS or x86 architecture processing unit (GPU).[312] Android supports OpenGL ES 1.1, 2.0, 3.0, 3.2 and since Android 7.0 Vulkan (and version 1.1 available for some devices[313]). Some applications may explicitly require a certain version of the OpenGL ES, and suitable GPU hardware is required to RISC-V.[314] In 2021, Android was ported to RI OS § Version history Explanatory notes ^ 12L launched as part of the March 2022 update to supported Pixel devices. The Factory Images for March 2022 and subsequent updates as 12.1 for the version. [22] Note: The software information on supported devices continues to show Android version 12 with no indication of the update. ^ The 2.3.6 update had the side-effect of impairing the Wi-Fi hotspot functionality of many Canadian Nexus S phones. Google acknowledged this problem and fixed it in late September. [78][79] ^ For Canadian consumers, 4.0.2 reportedly created a bug on the Galaxy Nexus that crashed the application market when users attempted to view details of any Android application. It also inadvertently reduced the NFC capabilities of the Nexus phone.[104][105] ^ Released as "Android 12.1" for smartphones ^ Lowest supported is revision 1 of MIPS32[303] and revision 6 for 64-bit MIPS64[302] ^ Disk-based memory (hard drives), solid state disk devices such as USB drives, DVD-based storage, bit rates, bus speeds, and network speeds, are specified using decimal meanings for K (10001), M (10002), G (10003), etc. References ^ Elgin, Ben (August 17, 2005). "Google Buys Android for Its Mobile Arsenal". Bloomberg Businessweek. Bloomberg. Archived from the original on February 27, 2011. Retrieved February 20, 2012. ^ "Dianne Hackborn". Google+. January 2, 2013. Archived from the original on June 12, 2013. Archived from the original on January 19, 2013. Archived from the original on January 2, 2013. Retrieved April 8, 2013. ^ "Don Morrill". Google+. January 2, 2013. Archived from the original on June 12, 2013. Archived from the original on January 19, 2013. 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