printout

Keystone MacCentral
January Meeting

Please see your membership email for the links
to this month's Zoom meeting or email us
at KeystoneMacCentral@mac.com.

During our program this month we plan to discuss
Freeform
available on your Mac, your iPad, or on your iPhone.
It uses a flexible canvas that supports almost any kind of file.
Use it for designing projects.

We have virtual meetings via Zoom
on the third Tuesday of each month.

Emails will be sent out prior to each meeting.
Follow the directions/invitation each month
on our email — that is, just click on the link
to join our meeting.

Contents

Keystone MacCentral is a not-for-profit group of Macintosh enthusiasts who generally meet the third Tuesday of every month to exchange information, participate in question-and-answer sessions, view product demonstrations, and obtain resource materials that will help them get the most out of their computer systems. Meetings are free and open to the public. **The *Keystone MacCentral printout*** is the official newsletter of Keystone MacCentral and an independent publication not affiliated or otherwise associated with or sponsored or sanctioned by any for-profit organization, including Apple Inc. Copyright © 2023, Keystone MacCentral, 310 Somerset Drive, Shiresmanstown, PA 17011.

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By Glenn Fleishman

Bring Yourself Recurring Joy with Apple's New Lock Screen Photo Shuffle

When I think about how technology as a whole has improved my life and the lives of people around me, I tend to focus on things like the development of vaccines, the improvement of chemotherapy and other oncology treatments, and emergency tools like the Apple Watch's fall detection and automated notifications of dangerous weather conditions.

If I instead ponder how technology has enhanced my happiness, the list is far shorter. I enjoy the quality of photography modern iPhones are capable of. I'm glad to have FaceTime, Zoom, and other videoconferencing tools to connect with family and friends. While Twitter and other social media are decidedly mixed bags, I've made new connections with people, and that was especially important for my mental well-being during the pandemic.

But what about pure joy? I'd have been hard-pressed to give you an answer to that until Apple let us add the Photos widget to the Home Screen in iOS 14 and iPadOS 15 and use Photo Shuffle as a Lock Screen wallpaper option in iOS 16. I have the Photos widget on my first Home Screen, and I created a custom Photo Shuffle for my Lock Screen as soon as I started using iOS 16. If only Apple could extend this sort of machine learning to the My Photos screensaver on the Apple TV.

My favorite thing each morning is to see what photo appears in the Photos widget on my Home Screen. That widget shows entries from the For You section in Photos. You might see an entry from Memories, the AI-generated oddball collections that

might include "Exploring Pittsburgh over the years" or "On this date."

But I most often see one of my Featured Photos, which I prefer. Featured Photos is a small, ephemeral album iOS assembles for me every day. Featured Photos nearly always contains 10 to 20 images of happy or interesting snapshots from my life, typically featuring my children.

Featured Photos, like Memories, relies on some kind of machine-learning algorithm that Apple doesn't describe. But I think it's far more successful than Memories, which sometimes shows me slideshows of weirdly disconnected or boring images. You can't push photos into a Featured Photos stack, although you can remove them. With an image showing in the Featured Photos collection in For You, tap the • • • icon in the upper-right

corner and tap Feature This Person Less or Remove from Featured Photos. The latter ensures you won't see that photo in rotation anymore.

Both Memories and Featured Photos have the potential to induce sadness or grief, of course. All technology companies should have learned a lesson from Eric Meyer's 2014 experience with Facebook, which rolled out a Year in Review feature that mindlessly showed him images of his six-year-old daughter Rebecca, who had died of brain cancer that year. Some smart companies brought Eric in to talk about the topic in the hope that his experience could help their products avoid this tragic error. (Rebecca's life is commemorated with rebeccapurple, an official CSS4 color name.)

Apple seems to have figured out some way of avoiding this. My life isn't full of death, disaster, and disagreement. But I have digitized nearly all photos I've taken over the last 40 of my *mumblety-mumble* years, including images of past romantic partners, broken or neglected friendships, and people I care about who have died. I rarely see anything from that data set, despite not having purged images from my Photos library that might, out of context, cause pain. The closest are photos of my mother with my kids that appear regularly, but not too frequently. She died in 2009. I find those images wistful, sweet, and a nice way to remember her in life.

I assume Apple's machine-learning system relies on signals stored locally and synced across my photo libraries. It knows who I've identified in the People album; I don't add people I want to forget. I assume Photos tracks how many times I view images and videos, and it knows which I've marked as favorites. And I occasionally do note that a photo should be removed from Featured Photos. Perhaps that's enough.

iOS 16's new Lock Screen Photo Shuffle feature has a different design that's also random but much more focused. When setting up Photo Shuffle as your Lock Screen wallpaper, you can pick Shuffle

Categories: People, Pets, Nature, and Cities. With People, you're presented with a subset of your People album and can select the people you want to see regularly. I expect Apple structured these choices to further constrain the appearance of unwanted images, which are less likely to be tolerable on the Lock Screen. You can remove troublesome photos, too, though it's a slog: in the Frequency options hidden behind the ••• icon, select Don't Feature Photo to remove it from future shuffled photos.
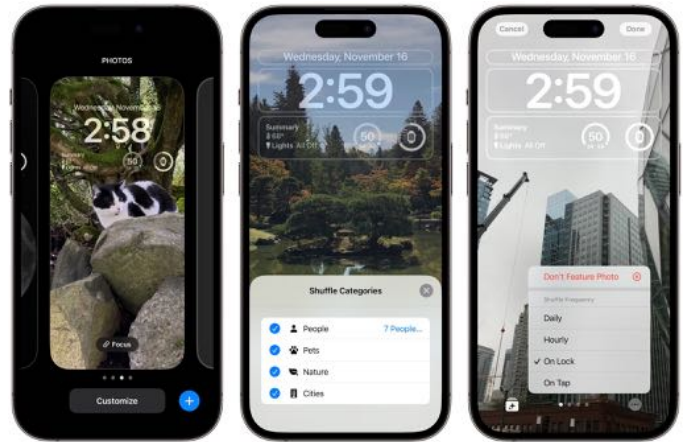
Although you can swipe through "all" the featured photos when customizing Photo Shuffle to start, it will add photos to the collection over time, so you may occasionally have to customize that Lock Screen again to remove an undesirable photo that the algorithm has chosen after your initial setup.

I set Photo Shuffle's frequency to the ridiculous update schedule of On Lock. Every time my iPhone lights up with an incoming alert, I raise it to view, or I press the Standby button, I get a new image. Weeks into using it, I haven't even begun to tire of the random presentation of photos of the people I love across decades of my life.

It turns out you can design a product to produce joy. Apple has chosen to hide the details of how it engineered this kind of delight, and that unpredictability might just be a key aspect of the pleasure of continuous rediscovery. 🗑

By Adam Engst

Apple's Advanced Data Protection Gives You More Keys to iCloud Data

Critics of cloud services often point—with a bit of finger-wagging—at the fact that cloud-stored data is theoretically vulnerable to being stolen by bad guys and handed over in response to government requests. That's true even if the data is encrypted in transit to and from user devices and at rest on the company's servers as long as the company maintains the encryption key necessary to decrypt the data.

The solution is conceptually simple—allow the user to generate and control all the encryption keys, a technique called *end-to-end encryption*. When that's true, the data is unreadable to anyone other than the user. Risks of eavesdropping, theft, and government overreach are greatly reduced. However, the user then has the ultimate responsibility to remember and protect those keys, and if something goes wrong, there is absolutely no recourse—without the appropriate key, the data is effectively gone. And yes, that happens all the time, much as with the people who forget their crypto wallet password and lose millions in funny money.

For some time, Apple has provided end-to-end encryption for 14 of the [26 types of iCloud data](#), including Health data, Passwords and Keychain, Apple Card transactions, and more. You may not realize that you control the encryption keys for those data types because Apple has integrated them into the overall security infrastructure underpinning its devices, operating systems, and online services. That's why it's so important to remember your iPhone/iPad passcode and Mac login password.

But for the twelve remaining types of iCloud data—iCloud Mail, Contacts, Calendars, iCloud Backup, iCloud Drive, Photos, Notes, Reminders, Safari Bookmarks, Siri Shortcuts, Voice Memos, and Wallet passes—Apple stores the encryption keys in Hardware Security Modules in its data centers.

For iCloud Mail, Contacts, and Calendars, the need to interoperate with external email, contacts, and calendar systems requires that Apple manage the encryption keys. For the other nine, Apple's control of the encryption keys enables the company to recover data for users who forget their passwords and have no fallback. (In such a situation, the end-to-end encrypted data types are lost.) But, of course, it also theoretically leaves that data vulnerable to hackers and law enforcement. iCloud Backup, which includes the encryption key for the otherwise end-to-end–encrypted Messages in iCloud, and Photos are the main data types to worry about in that list.

Very soon, those concerned about Apple holding their encryption keys will have some relief.

Enter Advanced Data Protection

Apple has announced [Advanced Data Protection for iCloud](#), a major upgrade to iCloud security that provides end-to-end encryption for the nine data types previously mentioned. Advanced Data Protection is optional—you must explicitly enable it—because it prevents Apple from recovering your data. That seems like a reasonable tradeoff because the people who are the most likely to forget their passwords and need recovery help from Apple are probably less likely to have problems with hackers or law enforcement.

When you set up Advanced Data Protection, you'll be prompted to set up alternate recovery methods, such as an [account recovery contact](#) or a printed recovery key, and you must set up at least one. Apple isn't going to make it easy for you to lose your data.

Luckily, it's not a one-way street. If you ever decide that you'd prefer Apple's recovery help to end-to-end encryption of things like iCloud Backup, you can turn Advanced Data Protection off with no data loss.

There are several technical consequences associated with enabling Advanced Data Protection beyond it not protecting iCloud Mail, Contacts, and Calendars:

• **iCloud.com Web access:** Turning on Advanced Data Protection automatically disables Web access to data at iCloud.com due to Apple's keys having been invalidated. You can turn Web access back on using a trusted device, but every visit to iCloud.com requires authorization from a trusted device, and the connection passes only normally accessible iCloud.com data (not Health, for instance) and only for an hour. If you make heavy use of iCloud.com, Advanced Data Protection may be burdensome.

• **Data sharing:** When you share notes, reminders, and iCloud Drive folders or use iCloud Shared Photo Library, all the data remains end-to-end encrypted and available only on the participants' devices as long as all users involved in sharing have Advanced Data Protection turned on. Sharing with anyone who's not using Advanced Data Protection or using the "anyone with a link" option when sharing makes the content available to Apple servers using Apple-controlled keys.

• **Collaboration:** The iWork collaboration capabilities and the Shared Albums feature of Photos don't support Advanced Data Protection. The real-time collaboration in iWork requires server-side mediation to coordinate document changes, so Apple has to maintain those keys. Since Shared Albums can be publicly shared on the Web, Apple also has to manage keys for that data.

• **Third-party apps:** Developers whose apps share data via iCloud must mark CloudKit fields as encrypted to have them protected by Advanced Data Protection, and it automatically protects all CloudKit assets.

• **Metadata:** For iCloud interface and optimization reasons, Apple retains the keys for some metadata associated with iCloud data types that are otherwise protected by Advanced Data Protection. That includes, for instance, the name, model, color, and serial number of the device associated with each backup and a list of apps and file formats included in the backup. Apple says it is working to include more metadata in Advanced Data Protection.

Advanced Data Protection Requirements and Timing

To enable Advanced Data Protection, your account must have two-factor authentication enabled for your Apple ID and a passcode or password set on your devices. Apple says that over 95% of active

iCloud accounts use two-factor authentication. (And if you don't have a passcode on your iPhone for some unfathomable reason, set one immediately. I'm looking at you, Alex.)

More problematic is Advanced Data Protection's requirement that all devices where you're signed in with your Apple ID *must* be updated to iOS 16.2, iPadOS 16.2, macOS 13.1, tvOS 16.2, watchOS 9.2, or the latest version of iCloud for Windows. That's because older versions wouldn't know to maintain newly created keys on the device and would try to upload them to Apple's servers in what the company calls "a misguided attempt to repair the account state." As a result, you'll have to sign out of iCloud on any device too old to upgrade to the necessary operating system version. (This requirement may be a deal-breaker for me since I have numerous elderly devices that remain in some level of use.)

Unsurprisingly, Advanced Data Protection is available only for regular Apple IDs. Managed Apple IDs (for employees to use for business purposes or instructors and students to use for educational purposes) and child accounts can't enable the option.

Apple says Advanced Data Protection for iCloud is available now for those testing betas of Apple's operating systems and will be available for all US users by the end of 2022. It will start rolling out to users in the rest of the world in early 2023 and may be available worldwide by the end of 2023.

Downstream Effects of Advanced Data Protection

In an interview with Joanna Stern of the Wall Street Journal, Apple's Craig Federighi said that the global release would include China, and he hadn't heard complaints from the Chinese government, which generally frowns on technology that prevents state surveillance. It doesn't seem inconceivable that China allowed Apple to provide Advanced Data Protection in exchange for a China-specific tweak in the recent iOS 16.1.1, which limits AirDrop from being accessible to "Everyone" for more than 10 minutes (AirDrop was being used by

protesters). Betas of iOS 16.2 include the same change for all other iPhone users, which, while nominally a loss of functionality, would prevent random creeps from using AirDrop to send nudes to nearby iPhone users.

Finally, you may also remember the furor surrounding Apple's botched 2021 proposal to scan on-device images for CSAM—child sexual abuse material. Those perturbed by the privacy implications of Apple's CSAM-detection proposal called instead for the company to live up to its privacy promises and implement end-to-end encryption for iCloud Photos. Advanced Data Protection does just that, raising the question of the status of Apple's CSAM plans and prompting an update from Apple.

It seems that I was correct with my second suggestion in "Apple Delays CSAM Detection Launch" (3 September 2021)—that the delay was "a face-saving way for Apple to drop the technology like the hot potato it became." Apple told Wired (emphasis mine):

After extensive consultation with experts to gather feedback on child protection initiatives we proposed last year, we are deepening our investment in the Communication Safety feature that we first made available in December 2021. We have further decided to not move forward with our previously proposed CSAM detection tool for iCloud Photos. Children can be protected without companies combing through personal data, and we will continue working with governments, child advocates, and other companies to help protect young people, preserve their right to privacy, and make the internet a safer place for children and for us all.

Apple also said it wasn't ready to announce a specific timeline for expanding its Communication Safety feature, but it is working on enabling Messages to detect nudity in transmitted videos when protection is enabled.

Overall, Advanced Data Protection seems like a major positive move on Apple's part. Once it ships, I'll give it a try and see what the practical effect is on old devices that can't run the latest operating systems. ⬛

By Adam Engst

Ensure Sufficient Free Space before Upgrading to Ventura

Two macOS releases ago, I wrote "Ensure Sufficient Free Space before Upgrading to Big Sur" (10 February 2021) to warn users that an installer bug could result in a Boot Recovery Assistant loop. Apple fixed that bug in macOS 11.2.1, but I was reminded of it when TidBITS reader Marc Heusser wrote to tell us that upgrading from macOS 12.6.1 Monterey to macOS 13.0.1 Ventura on an M1 MacBook Pro with insufficient free space resulted in errors that prevented the MacBook Pro from booting. Marc had to restore from backup to bring his MacBook Pro back to working order.

So what counts as "sufficient" space? In my previous article, I linked to the tech specs for Big Sur, in which Apple says that it could require up to 44.5 GB of available storage. Unfortunately, Apple hasn't published similar specs for either Monterey or Ventura. However, our old friend Charles Edge recently published the necessary details in Free Space Required for Modern macOS Upgrades. In it, he says that Ventura requires 25 GB of free space and that its installer clocks in at 12.19 GB, suggesting that it would be safest to add those numbers and make sure you had at least 37 GB free.

Without Apple providing specs, I was curious where Charles came up with that 25 GB number, and he told me that it was from personal experience. He had tried to install Ventura on a Mac without that much space and received a prompt from the installer telling him he needed to free up at least 25 GB. A post from Trend Micro confirmed that number wasn't somehow specific to his Mac. So a minimum of 37 GB it is, for safety's sake.

What could have happened in Marc Heusser's case? The Ventura installer clearly thought he had enough free space to continue, rather than throwing an alert as it did for Charles. Marc speculated that the problem was due to APFS snapshots, and unfortunately, that's likely. As useful as APFS is, it renders the concept of "free space" somewhat indeterminate. Howard Oakley explains some of the complexity involved. As you can see in the screenshot from Howard's Mints utility (click the Volumes button), my Mac's primary drive has 75 GB free, but 94 GB available for "opportunistic usage" and as much as 143 GB available for "important usage." The Finder reports the 143 GB number.
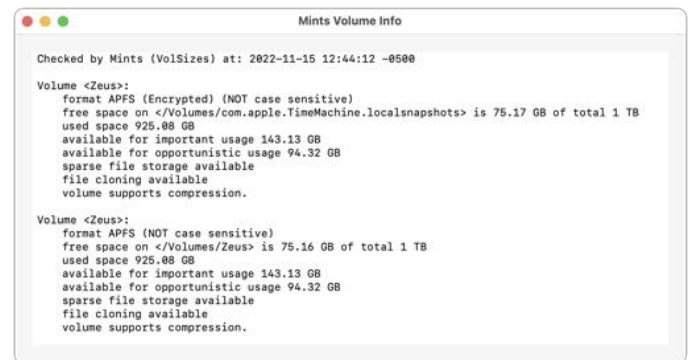
My best guess is that there's an edge case where the installer believes there's enough space available to start (assuming that an upgrade is either opportunistic or important), but when it starts copying files, APFS doesn't always release the needed purgeable space.

Charles reported that since he published that article, he too has heard from a handful of people who have suffered a failed Ventura upgrade and have thus been forced to start over with a clean install.

So, what should you take away from all this?

• **Back up first:** Make at least one full backup of your drive before upgrading to Ventura. I say that every time, and I will continue to do until the heat death of the universe. (What, you didn't make a copy of the Milky Way?) And when I say "at least" one backup, I mean it. I would never upgrade my main Mac without both an up-to-date Time Machine backup and a duplicate. Drives fail, and you don't want your only backup to fail when you need it to restore after an unexpected catastrophe.

(While writing this article, I unmounted my Time Machine SSD, and it didn't want to remount again, even after a restart. It mounted fine on another Mac, where I'm running First Aid on it right now.)

- **Check free space carefully:** I'm going to go out on a limb here and suggest that you shouldn't trust the Finder's claims of free space. It reports the maximum amount of free space that could be achieved after deleting purgeable data. Instead, open Disk Utility, select the top level of your boot volume (not the Data volume underneath), and use its free space number—76 GB in the screenshot below.
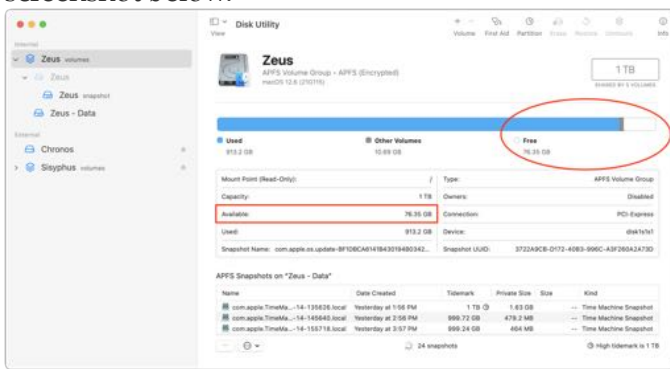

- **Clear at least 37 GB:** If that free space number isn't at least 37 GB, remove enough data to get it to that point. To begin, empty your Trash and restart. I had about 1 GB of data in the Trash, which brought me up to 77 GB free, but that number jumped to 86 GB after I restarted. If you need to remove more data, choose About This Mac from the Apple menu, click Storage, and click the Manage button next to the desired drive to open System Information's Storage Management window. Then click Documents and work through Large Files, Downloads, and Unsupported Apps, deleting unnecessary data, preferably larger files.

Alternatively, a utility such as [GrandPerspective](#) or [OmniDiskSweeper](#) can easily identify large files and folders.

-
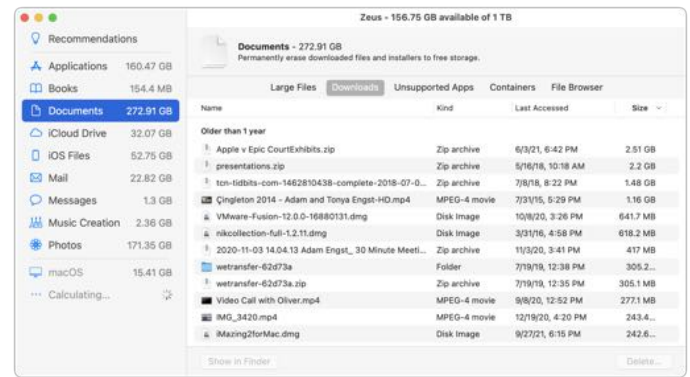
You could also use Disk Utility to delete Time Machine snapshots, but I'm uncomfortable recommending that without being able to test it myself. (As I noted above, my Time Machine drive isn't happy right now.) If you want to experiment with this approach, open Disk Utility, select your boot volume, and choose View > Show APFS Snapshots. Then you can select a snapshot in the list and click the – button to delete it. (The screenshot is from my MacBook Air, which seldom does Time Machine backups because I rarely work on local data.)
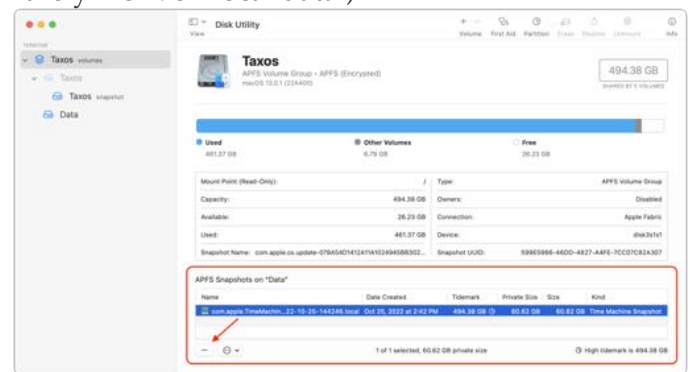
Apple Updates

Apple Service Utility
Dec 20, 2022 – 4MB

System Requirements
    – macOS Monterey 12.4 or later

Apple Service Utility is used to configure Apple Studio Display after logic board and display repairs.

Shortcuts

Learn about the new features in Shortcuts for iOS, iPadOS, macOS, and watchOS.

Get complete step-by-step instructions and information on all the features in Shortcuts:

This update includes new Books app actions, enhancements to existing actions, and reliability improvements to the Shortcuts editor and library.

New Actions

• Switch Between Wallpapers sets the current wallpaper on iOS

• Get Wallpaper returns all of the wallpapers added to the Lock Screen on iOS

Updated Actions

For those building custom shortcuts, some actions have been updated:

• Set Wallpaper Photo can now set photos for wallpapers that use iOS 16's new widgets and customization options

• Get Battery State can now check charging state (charging, connected to charger)

• Edit Calendar Event can now set invitee status (declined or accepted)

• Find Calendar Events can filter events by number of attendees

• Find Health Samples can now return sleep phases (core, deep, REM) on iOS

• Set Parked Car now accepts locations other than the current location

• Speak Text runs more reliably when a shortcut is invoked as a part of an automation

• Start Timer now prompts to select a duration when set to "Ask Each Time" and run via Siri

New in iOS and iPadOS 16.1, macOS 13.0, and watchOS 9.1

This update adds support for Share Sheet shortcuts on macOS, and includes new actions and reliability improvements to the Shortcuts editor and library.

New Actions

Clock

• Open Tab is now supported

• Create Alarm, Toggle Alarm, Get All Alarms, and Start Timer are now supported on macOS

Reminders

• Open Smart List is now supported on iOS and iPadOS

Safari

• Get Article using Safari Reader is now supported on macOS

More

• Get Current Focus enables checking current Focus status

• Configure Focus Filter actions allow setting Focus Filters for apps on macOS

• Search in Shortcuts allows starting a search in the Shortcuts app

Updated Actions

For those building custom shortcuts, some actions have been updated:

• Send Email now supports rich text on macOS

• Health actions can now run when the Health app is not installed

• Configure Focus Filter actions now support Ask Each Time

• Get Current Weather now correctly returns weather information when run from a Home automation

New in iOS and iPadOS 16.0 and watchOS 9.0

This update adds support for App Shortcuts to allow you to run shortcuts with no setup, and includes new actions and updates to the Shortcuts editor and library.

New Actions

Safari

• Open Tab Group, Create Tab Group, Open View, Find Bookmarks, Open Bookmark, Find Reading List Items, Open Reading List Item, Show/Hide Reader in Safari, Close Tab, Create New Tab, Create New Private Tab, Find Tabs, and Open Tab are now supported

Maps

• Get Parked Car Location and Set Parked Car are now supported

Clock

• Open Tab is now supported

Notes

• Delete Notes, Pin Notes, Open Notes Account, Change Notes Setting, Open Notes View, Create Folder, Delete Folders, Move Notes to Folder, Open Folder, Add Tags to Notes, Create Tag, Delete Tags, Open Tag, and Remove Tags from Notes are now supported

Mail

• Open Mailbox, Search in Mail are now supported

Voice Memos

• Search Voice Memos, Open Folder, Open Recording, Delete Folders, Play Recording, Create Folder, Change Playback Setting, Delete Recordings, and Create Recording are now supported

Reminders

• Create List and Search in Reminders are now supported

Files

• Search in Files is now supported

More

• Configure Focus Filter actions allow setting Focus Filters for apps

• Create Shortcut, Delete Shortcuts, and Open Folder are now supported with Shortcuts

• Optimize File Size of PDF compresses the images inside a PDF, resulting in a smaller file size

• Remove Image Background removes the background of images, keeping the subject only

• Set Flashlight can now control the flashlight on watchOS

• Set Personal Hotspot toggles the status of Personal Hotspot on iOS

Updated Actions

For those building custom shortcuts, some actions have been updated:

• Find Calendar Events filters events by invitee status (declined or accepted)

• Create Note and Append to Note now support Rich Text

• Find Notes no longer has a limit to how many notes can be retrieved at a time

- If conditionals now correctly match the "ends with" condition

- Shazam It can recognize music when a shortcut is invoked via Siri

- View Content Graph has an improved interface for content graph browsing

Shortcuts editor

For those building custom shortcuts, some changes have been made to the shortcut editor:

- New keyboard shortcuts are available on iPadOS for faster editing

- Icon search lets users find shortcut icon glyphs by name

- Quick controls in the shortcut document menu include: Rename, Choose Icon, Duplicate, Move, Add to Home Screen, and Export File

- Next Action Suggestions can now be dragged and dropped into a shortcut

- Improved performance and reliability

iPadOS 16 Updates

This update introduces Freeform, an app that offers a great place to brainstorm and bring your ideas to life. This release also adds Stage Manager improvements, Apple Music Sing, Advanced Data Protection for iCloud, and other features and bug fixes for your iPad.

Freeform

- Freeform is a new app for working creatively with friends or colleagues on Mac, iPad and iPhone

- A flexible canvas lets you add files, images, stickies, and more

- Drawing tools let you sketch anywhere on the canvas with your finger or Apple Pencil

Stage Manager

- External display support with resolutions up to 6K available on iPad Pro 12.9-inch (5th generation

and later), iPad Pro 11-inch (3rd generation and later), and iPad Air (5th generation)

- Drag and drop files and windows from your compatible device to your connected display, and vice versa

- Support for using up to 4 apps on the iPad display and 4 on the external display

Apple Music Sing

- A new way to sing along with millions of your favorite songs in Apple Music

- Fully adjustable vocals let you duet with the original artist, sing solo, or mix it up

- Newly enhanced beat-by-beat lyrics make it even easier to follow along with the music

Advanced Data Protection for iCloud

- New option expands the total number of iCloud data categories protected using end-to-end encryption to 23 — including iCloud Backup, Notes, and Photos — protecting your information even in the case of a data breach in the cloud

Game Center

- SharePlay support in Game Center for multiplayer games so you can play with the people you are on a FaceTime call with

- Activity Widget allows you to see what your friends are playing and achieving in games right from your Home Screen

Home

- Improved reliability and efficiency of communication between your smart home accessories and Apple devices

- Improved search in Messages allows you to find photos based on their content, like a dog, car, person, or text

- Reload and Show IP Address setting enables iCloud Private Relay users to temporarily disable the service for a specific site in Safari

- News articles in Weather display information relevant to the weather in that location

- Participant Cursors in Notes allow you to see live indicators as others make updates in a shared note

- AirDrop now automatically reverts to Contacts Only after 10 minutes to prevent unwanted requests to receive content

- Fixes an issue that causes some notes not to sync with iCloud after updates are made

- Fixes an issue that may cause Multi-Touch gestures to become unresponsive while using the Zoom accessibility feature

iPadOS 16.1.1

This update includes bug fixes and security updates and is recommended for all users.

iPadOS 16.1

iCloud Shared Photo Library

- Separate library for seamlessly sharing photos and videos with up to five other people

- Setup rules allow you to easily contribute past photos based on start date or people in the photos when you set up or join a library

- Library filters for quickly switching between viewing the Shared Library, your Personal Library, or both libraries together

- Shared edits and permissions let everyone add, edit, favorite, caption, and delete photos

- Sharing toggle in Camera lets you choose to send photos you take straight to the Shared Library, or enable a setting to share automatically when other participants are detected nearby using Bluetooth

Messages

- Edit a message for up to 15 minutes after sending it and recipients see a record of edits

- Undo send allows you to recall any message up to 2 minutes after sending it

- Mark as unread makes it easy to come back to a conversation later

- SharePlay in Messages lets you enjoy activities like watching movies, listening to music, playing games, and more with friends while messaging

- Collaboration provides a simple way to invite others to collaborate on a file via Messages and get activity updates in the thread when someone makes an edit to a shared project

Mail

- Improved search delivers more accurate, complete results and provides suggestions as soon as you begin to type

- Undo send allows you to cancel delivery of a message within 10 seconds of hitting send

- Scheduled send for sending an email at a specific day and time

- Follow-up surfaces sent emails that have not been replied to, to the top of your inbox so you can quickly follow-up

- Remind me lets you schedule a date and time to be reminded about an email

Safari and Passkeys

- Shared Tab Groups let you share a set of tabs with others and see the Tab Group update instantly as you work together

- Tab Group start pages can be customized with different background images and favorites for each Tab Group

- Pinned tabs in Tab Groups enable you to pin frequently visited websites for each Tab Group

- Safari web page translation adds translation for web pages in Turkish, Thai, Vietnamese, Polish, Indonesian, and Dutch

- Passkeys offer support for an easier and safer sign-in method to replace passwords

- Passkey syncing through iCloud Keychain makes your passkeys available across all your Apple devices while keeping them end-to-end encrypted

Stage Manager

- A new way to multitask on iPad Pro 12.9-inch (3rd generation and later), iPad Pro 11-inch (1st generation and later) and iPad Air (5th generation)

- Overlapping and resizable windows allow you to adjust the size of your apps and arrange your ideal workspace

- Recent Apps arranged on the left of the screen allow you to quickly switch between apps

- App groups allow you to create sets of apps that you can quickly get back to

New Display Modes

- Reference Mode delivers reference color for popular color standards and video formats on the 12.9-inch iPad Pro with Liquid Retina XDR display and with Sidecar, use it as a reference display for your Apple silicon Mac

- New display scaling setting that increases the pixel density so you can view more in your apps on iPad Pro 11-inch (1st generation and later), iPad Pro 12.9-inch (5th generation and later) and iPad Air (5th generation)

Weather

- Weather app on iPad is optimized for the larger display, including immersive animations, detailed maps, and tappable forecast modules

- Weather maps show precipitation, air quality, and temperature alongside the location view or in full screen

- Tappable modules reveal more detail such as hourly temperature or precipitation forecasts for the next 10 days

- Air quality displays a color-coded scale for air quality, level and category, and you can view air quality on a map to see related health recommendations, pollutant breakdown, and more

- Animated backgrounds represent the sun position, clouds, and precipitation with thousands of variations

- Severe weather notifications let you know when a severe weather alert has been issued near you

Game Center

- In-Game Dashboard Activity shows you what your friends are accomplishing in this game, and what they are playing and achieving across all games in one place

- Game Center Profiles highlight your achievement and leaderboard activity across all of the games you play

- Contacts integration shows your friends' Game Center profiles and lets you see what they are playing and accomplishing in games

Live Text

- Live Text video support allows you to interact with text in a paused video frame so you can copy, translate, look up, share, and more available on iPad (8th generation and later), iPad mini (5th generation and later), iPad Air (3rd generation and later), iPad Pro 12.9-inch (3rd generation and later) and iPad Pro 11-inch all models

- Quick actions let you take action on data detected in photos and videos with a single tap, so you can track flights or shipments, translate foreign languages, convert currencies, and more, available on iPad (8th generation and later), iPad mini (5th generation and later), iPad Air (3rd generation and later), iPad Pro 12.9-inch (3rd generation and later) and iPad Pro 11-inch all models

Visual Look Up

- Lift subject from background isolates the subject of an image so you can copy and paste it into apps like Mail and Messages, available on iPad (8th generation and later), iPad mini (5th generation and later), iPad Air (3rd generation and later),

iPad Pro 12.9-inch (3rd generation and later) and iPad Pro 11-inch all models

- Visual Look Up adds recognition of birds, insects, spiders, and statues in your photos available on iPad (8th generation and later), iPad mini (5th generation and later), iPad Air (3rd generation and later), iPad Pro 12.9-inch (3rd generation and later) and iPad Pro 11-inch all models

Siri

- Easy Shortcuts setup makes it possible to run shortcuts with Siri as soon as you download an app with no upfront setup

- A new setting allows you to send messages without Siri asking you to confirm before sending

- "Hey Siri, what can I do here?" helps you discover Siri capabilities in iPadOS and apps just by asking, available on iPad (8th generation and later), iPad mini (5th generation and later), iPad Air (3rd generation and later), iPad Pro 12.9-inch (3rd generation and later) and iPad Pro 11-inch all models

- Call hang up option for ending Phone and FaceTime calls with Siri by saying "Hey Siri, hang up", available on iPad (8th generation and later), iPad mini (5th generation and later), iPad Air (3rd generation and later), iPad Pro 12.9-inch (3rd generation and later) and iPad Pro 11-inch all models

- Emoji support lets you insert emoji using your voice when sending messages on iPad (8th generation and later), iPad mini (5th generation and later), iPad Air (3rd generation and later), iPad Pro 12.9-inch (3rd generation and later) and iPad Pro 11-inch all models

Dictation

- All-new Dictation experience supports using your voice along with keyboard or Apple Pencil to enter and edit text, available on iPad (8th generation and later), iPad mini (5th generation and later), iPad Air (3rd generation and later), iPad Pro 12.9-inch (3rd generation and later) and iPad Pro 11-inch all models

- Automatic punctuation inserts commas, periods, and question marks as you dictate

- Emoji support lets you insert emoji using your voice while dictating, available on iPad (8th generation and later), iPad mini (5th generation and later), iPad Air (3rd generation and later), iPad Pro 12.9-inch (3rd generation and later) and iPad Pro 11-inch all models

Maps

- Multi-stop routing supports adding up to fifteen stops along your driving route in Maps

- Transit fares show you how much your journey will cost in the San Francisco Bay Area, London, New York, and more

Home

- Redesigned Home app makes it easier to navigate, organize, view, and control your smart home accessories

- Home tab now integrates all your accessories, rooms, and scenes into a single tab for a whole-house view, allowing you to see your entire home at a glance

- Categories for lights, climate, security, speakers and TVs, and water let you quickly access all the relevant accessories organized by room, and displays more detailed status information

- New camera view displays up to four cameras front and center in the Home tab, scroll to see any additional camera views in your home

- Redesigned accessory tiles feature more visually recognizable icons that are color-matched to their category, and new behaviors for more precise accessory controls

- Matter, the new smart home connectivity standard, is supported enabling a wide variety of smart home accessories to work together across ecosystems

News

- My Sports enables you to easily follow your favorite teams and leagues and watch highlights right in the News app

- Favorites give you easy access to the channels and topics you read the most, in a consistent place near the top of your Today feed

- New homepages deliver visually updated and easier to navigate topic feeds for local news locales, sports teams and leagues, and more

Family Sharing

- Improved child account setup makes it easier to create an account for a child with the right parental controls, including age-appropriate media restrictions

- Device setup for a child lets you use Quick Start to easily set up a new iOS or iPadOS device for your child with your selected parental controls in place

- Screen Time requests in Messages make it even easier to approve or decline requests from your child

- Family Checklist gives you tips and suggestions like updating a child's parental control settings, turning on location sharing, or just reminding you to share your iCloud+ subscription with everyone

Desktop-Class Apps

- Customizable toolbars allow you to add the features you use most often in your apps

- Menus provide additional context for actions such as close, save, and duplicate, making it easier to edit documents and files in apps like Pages and Numbers

- Find and Replace is available in apps across the system, including Mail, Messages, Reminders, and Swift Playgrounds

- Availability view in Calendar shows availability of invited participants when you create meetings in Calendar

Accessibility

- Door detection in Magnifier locates a door, reads signs and symbols around it, and gives you instructions for how to open the door

- Live Captions (beta) automatically converts audio into text for users who are Deaf or hard of hearing to follow along more easily with calls and media content

- Buddy controller helps users with cognitive disabilities get support from a caregiver or friend while playing a game, by combining inputs from multiple game controllers into one

- VoiceOver is now available in over 20 new languages and locales, including Bangla (India), Bulgarian, Catalan, Ukrainian, and Vietnamese

- Voice Control spelling mode gives you the option to dictate names, addresses, or other custom spellings letter by letter

Other features and improvements:

- New Watercolor, Monoline, and Fountain pens in Notes

- AirPods Pro (2nd generation) support, including Find My and Precision Finding for the MagSafe Charging Case as well as Personalized Spatial Audio for a more precise and immersive listening experience, also available on AirPods (3rd generation), AirPods Pro (1st generation), and AirPods Max

- Handoff in FaceTime allows you to move FaceTime calls seamlessly from your iPad to your iPhone or Mac, and vice versa

- Memoji updates include more sticker poses, hairstyles, headwear, noses, and lip colors

- Translate camera lets you translate text around you using the camera in the Translate app

- Duplicate detection in Photos identifies duplicate photos so you can quickly clean up your library

- Pinned lists in Reminders helps you quickly navigate to your favorite lists

- Search on the Home Screen enables Spotlight to be accessed directly from the bottom of the Home

Screen, making it easy to open apps, find contacts, or get information from the web

- Rapid Security Response gets important security improvements to your devices even faster, as they can be applied automatically between standard software updates

watchOS 9 Updates

watchOS 9.2

watchOS 9.2 includes new features, improvements, and bug fixes, including:

- Outdoor Run workout now automatically detects when you arrive at a running track and provides track specific metrics (United States only)

- Race Route lets you compete against your previous performance in Outdoor Run, Outdoor Cycle, and Outdoor Wheelchair Workouts

- New custom Kickboxing algorithm in the Workout app for more accurate metrics

- Noise app displaying when environmental sound levels are reduced now available with AirPods Pro (1st generation) and Airpods Max when using active noise cancellation

- Family Setup users can be invited to the Home app to control HomePod speakers and smart home accessories, and unlock doors with home keys in Wallet

- Accessibility support to visualize when Siren is in use on Apple Watch Ultra

- Improved response time and accuracy of hand gesture controls for AssistiveTouch and Quick Actions

- Crash Detection optimizations on Apple Watch Ultra, Apple Watch Series 8, and Apple Watch SE (2nd generation)

- Fix for bug that causes display of incorrect watch time immediately after dismissing an alarm in Sleep Focus

- Fix for bug causing interruptions to mindfulness sessions

watchOS 9.1

This update includes improvements for your Apple Watch.

- Battery life extended during Outdoor Walking, Running, and Hiking Workouts with the ability to reduce the frequency of heart rate and GPS readings on Apple Watch Series 8, Apple Watch SE (2nd generation) and Apple Watch Ultra

- Music can download while Apple Watch is off charger using Wi-Fi or cellular

- Matter, the new smart home connectivity standard, is supported enabling a wide variety of smart home accessories to work together across ecosystems

This update also includes bug fixes for your Apple Watch.

- Voice feedback of average pace during Outdoor Run may be incorrect

- Chance of rain estimates shown in Weather app may not match estimates on iPhone in current location

- Hourly weather complication may label times as AM during PM hours

- Time duration displayed during Strength Training Workout may not advance for some users

- VoiceOver may not announce app name prior to reading notification when receiving multiple notifications

watchOS 9.0.2

This update includes improvements and bug fixes for your Apple Watch.

- Interruptions to streaming audio on Spotify

- Snooze alarm notifications continue after the alarm is deleted for AssistiveTouch users

- Incomplete syncing of Wallet and Fitness data for newly paired Apple Watch

- Audio from microphone interrupted for some Apple Watch Series 8 and Ultra users

watchOS 9.0.1

This update includes improvements and bug fixes for your Apple Watch Ultra.

- Audio could be distorted during phone calls using speakers

watchOS 9

Watch Faces

- Astronomy now displays current cloud coverage and star map

- Lunar includes a Chinese, Hebrew, or Islamic lunar calendar wrapped around a moon with a live rendering of moon phases

- Playtime includes animated numbers designed by Chicago artist Joi Fulton with editing options for background colors

- Metropolitan features a type-driven watch face with numbers that dynamically change in style and weight as you turn the Digital Crown

- Nike Analog, Nike Bounce, Nike Compact, Nike Digital, and Nike Hybrid, all with a tappable Nike Swoosh that launches Nike Run Club, are now available for more models of Apple Watch

- Rich Complications, Chinese script options, and background color editor available on Breathe, California, Modular, Typograph and more

- Portraits now supports portraits of dogs and cats and landscapes with the ability to customize the color of the background or entire photo

- Ability to choose the watch face displayed when a Focus is active

Workout

- Ability to customize and scroll through multiple Workout Views during a workout including Splits, Segments, Activity Rings, and more

- Heart Rate Zones view uses max and resting heart rate to create personalized zones and shows time spent in each zone

- Elevation view displays current elevation and elevation gain and visually maps your elevation progress during Outdoor Run, Outdoor Cycle, Outdoor Wheelchair Run Pace, Hiking, Outdoor Walk and Outdoor Wheelchair Walk Pace

- Running Power view, measured in watts, shows an instantaneous measure of how much power is generated during your run (Apple Watch SE and Apple Watch Series 6 and later)

- Running Form Metrics including Stride Length, Ground Contact Time, and Vertical Oscillation available in Workout Views to monitor and trend running efficiency (Apple Watch SE and Apple Watch Series 6 and later)

- Custom Workout enables you to create Workouts with repeating sets of intervals that can be based on a time, distance or an open goal with automatic or manual advancement to your next set

- Pacer provides a training experience to help you sustain a desired pace using alerts and a dedicated workout view

- Multisport Workout supports duathlon or triathlon training with automatic detection of Open Water/Pool Swim, Indoor/Outdoor Cycle, Indoor/Outdoor Run, and transitions to the next leg

- Workout alerts can be customized for metrics like pace, power, cadence, and heart rate zones

- Pool Swim workouts automatically detect kickboard

- SWOLF swimming efficiency metric calculated as stroke count plus time to complete lap

Fitness+

- Trainer guidance displayed on-screen including targets for Intensity, strokes per minute for Rowing, revolutions per minute for Cycling, and incline percentage for Treadmill

- Trainer guidance and personal fitness metrics displayed on-screen for compatible third party TVs and devices

Compass

- Redesigned compass app with more in-depth information and zoomable views (Apple Watch SE and Apple Watch Series 5 and later)

- Primary face supports both an analog compass dial and a digital view of current bearing and direction

- Zoomed view provides analog view of bearing plus your elevation, incline and coordinates

- Compass Waypoints allow you to mark your position or point of interest (Apple Watch SE and Apple Watch Series 6 and later)

- Backtrack uses GPS to track your historic path in case you get lost or disoriented (Apple Watch SE and Apple Watch Series 6 and later)

Sleep

- Sleep stage tracking using data from the accelerometer and heart rate sensor to detect time spent in REM, Core, and Deep sleep, as well as awake

- Comparisons chart provides a view of heart rate and respiratory rate alongside time asleep in the Health app on iPhone

Medications

- Capabilities to log as-needed and scheduled medications, including the amount and time taken

- Ability to view medication schedule and what you have logged for the day

- Reminders to log scheduled medications

- Medications complication to see your schedule or quickly open the app

AFib History

- Weekly notifications with estimate of the percentage of time spent in atrial fibrillation during previous calendar week

- Highlights show which day of week and time of day when AFib is highest

- Tracking of lifestyle factors that may influence time spent in AFib including Exercise, Sleep, Weight, Alcohol Consumption, and Mindful Minutes in the Health app on iPhone

- Sharable PDF for richer conversations with healthcare providers

- Support for users 22 years or older with diagnosis of atrial fibrillation

Family Setup

- Podcasts app is now available and includes ability to search, download, follow shows, and explore curated content

- Third party email support extended to Yahoo and Outlook

- Editing and sharing contact photos now available

Accessibility

- Expanded Quick Actions with AssistiveTouch for play and pause in Now Playing, pause and resume in Workout, take a photo using Camera Remote, and toggle between map view and turn-by-turn directions in Maps

- Bluetooth keyboard pairing with Apple Watch

- Apple Watch Mirroring lets you control Apple Watch remotely from your paired iPhone via AirPlay with support for assistive technologies like Voice Control or Switch Control as an alternative to tapping the Apple Watch display

Other features and improvements:

- Low Power Mode maintains core features of Apple Watch while temporarily disabling select background features such as always on display and heart health notifications to extend battery life

- Support for international roaming allows you to stay connected to your cellular network while traveling abroad (Apple Watch SE and Apple Watch Series 5 and later)

- Expanded keyboard languages including French, German, Italian, Japanese, Portuguese, and

Spanish available on Apple Watch Series 7 and later

- Communication safety setting in Screen Time gives parents the ability to enable warnings for children when they receive or attempt to send photos that contain nudity in Messages

- Cycle deviation notifications alert you if your logged menstrual cycles show a pattern of infrequent periods, irregular periods, prolonged periods, or persistent spotting

- New Cardio Recovery metric estimated by Apple Watch available in the Health app

- Reminders app updated to support editing so you can add key details like location, tags, and due times

- Calendar app redesigned to support creation of new calendar events with ability to switch to day, list, and week views

- Enhanced Podcast experience with support for search, ability to follow and unfollow shows, and discover new content in Listen Now

- Dock updated to show apps running in background at the top

- Notifications redesigned with streamlined slimline banner when actively using Apple Watch

iOS 16 Updates

iOS 16.2

Freeform

- Freeform is a new app for working creatively with friends or colleagues on Mac, iPad and iPhone

- A flexible canvas lets you add files, images, stickies, and more

- Drawing tools let you sketch anywhere on the canvas with your finger

Apple Music Sing

- A new way to sing along with millions of your favorite songs in Apple Music

- Fully adjustable vocals let you duet with the original artist, sing solo, or mix it up

- Newly enhanced beat-by-beat lyrics make it even easier to follow along with the music

Advanced Data Protection for iCloud

- New option expands the total number of iCloud data categories protected using end-to-end encryption to 23 — including iCloud Backup, Notes, and Photos — protecting your information even in the case of a data breach in the cloud

Lock Screen

- New settings allow you to hide wallpaper or notifications when Always-On display is enabled on iPhone 14 Pro and iPhone 14 Pro Max

- Sleep widget lets you view your most recent sleep data

- Medications widget lets you view reminders and quickly access your schedule

Game Center

- SharePlay support in Game Center for multiplayer games so you can play with the people you are on a FaceTime call with

- Activity Widget allows you to see what your friends are playing and achieving in games right from your Home Screen

Apple TV

- Live Activities for Apple TV app let you follow your favorite teams with live scores right on your Lock Screen or in Dynamic Island on iPhone 14 Pro and iPhone 14 Pro Max

Home

- Improved reliability and efficiency of communication between your smart home accessories and Apple devices

This update also includes the following improvements and bug fixes:

- Improved search in Messages allows you to find photos based on their content, like a dog, car, person, or text

- Reload and Show IP Address setting enables iCloud Private Relay users to temporarily disable the service for a specific site in Safari

- News articles in Weather display information relevant to the weather in that location

- Participant Cursors in Notes allow you to see live indicators as others make updates in a shared note

- AirDrop now automatically reverts to Contacts Only after 10 minutes to prevent unwanted requests to receive content

- Crash Detection optimizations on iPhone 14 and iPhone 14 Pro models

- Fixes an issue that causes some notes not to sync with iCloud after updates are made

iOS 16.1.2

This update provides important security updates and the following enhancements for your iPhone:

- Improved compatibility with wireless carriers

- Crash Detection optimizations on iPhone 14 and iPhone 14 Pro models

iOS 16.1.1

This update includes bug fixes and security updates and is recommended for all users.

iOS 16.1

This update introduces iCloud Shared Photo Library making it easy to keep your family photos up to date. This release also adds support for third party apps in Live Activities, support for Apple Fitness+ on iPhone even if you don't have an Apple Watch, and includes other features and bug fixes for your iPhone.

iCloud Shared Photo Library

- Separate library for seamlessly sharing photos and videos with up to five other people

- Setup rules allow you to easily contribute past photos based on start date or people in the photos when you set up or join a library

- Library filters for quickly switching between viewing the Shared Library, your Personal Library, or both libraries together

- Shared edits and permissions let everyone add, edit, favorite, caption, and delete photos

- Sharing toggle in Camera lets you choose to send photos you take straight to the Shared Library, or enable a setting to share automatically when other participants are detected nearby using Bluetooth

Live Activities

- Live Activities from third party apps are available in the Dynamic Island and on the Lock Screen for iPhone 14 Pro models

Fitness+

- Apple Fitness+ is supported on iPhone even if you don't have an Apple Watch

Wallet

- Key sharing enables you to securely share car, hotel room, and other keys in Wallet using messaging apps such as Messages and WhatsApp

Home

- Matter, the new smart home connectivity standard, is supported enabling a wide variety of smart home accessories to work together across ecosystems

Clean Energy Charging

- New setting that can try to reduce your carbon footprint by selectively charging when lower carbon emission electricity is available

Books

- Reader controls are automatically hidden as you start reading

This update also includes bug fixes for your iPhone:

- Deleted conversations may appear in the conversations list in Messages

- Dynamic Island content is not available when using Reachability

- CarPlay may fail to connect when using a VPN app

iOS 16.0.3

This update provides bug fixes and important security updates for your iPhone including the following:

- Incoming call and app notifications may be delayed or not delivered on iPhone 14 Pro and iPhone 14 Pro Max

- Low microphone volume can occur during CarPlay phone calls on iPhone 14 models

- Camera may be slow to launch or switch between modes on iPhone 14 Pro and iPhone 14 Pro Max

- Mail crashes on launch after receiving a malformed email

iOS 16.0.2

This update provides bug fixes and important security updates for your iPhone including the following:

- Camera may vibrate and cause blurry photos when shooting with some third-party apps on iPhone 14 Pro and iPhone 14 Pro Max

- Display may appear completely black during device setup

- Copy and paste between apps may cause a permission prompt to appear more than expected

- VoiceOver may be unavailable after rebooting

- Addresses an issue where touch input was unresponsive on some iPhone X, iPhone XR, and iPhone 11 displays after being serviced

iOS 16.0.1

This update is recommended for all iPhone 14 and iPhone 14 Pro users and provides important bug fixes including the following:

- iMessage and FaceTime may not complete activation

- Photos may appear soft when zooming in landscape orientation on iPhone 14 Pro Max

- Enterprise single sign-on apps may fail to authenticate

iOS 16

Lock Screen

- Redesigned Lock Screen gives you all new ways to personalize your Lock Screen by showcasing favorite photos, customizing font styles, displaying widgets, and more

- Multiple Lock Screens can be created and you can easily switch between them

- Lock Screen gallery offers personalized suggestions along with Apple curated collections for your Lock Screen

- Font and color options for customizing the look of the date and time on your Lock Screen

- Widgets on the Lock Screen display information at a glance like the weather, battery levels, upcoming calendar events, and more

- A new effect places the subject of the photo in front of the time (iPhone XS and later)

- Photo styles change the color filter, tinting, and font style of photos on the Lock Screen to complement each other

- Notifications appear at the bottom of your Lock Screen and can be displayed in an expanded list view, stacked view, or count view

Focus

- Lock Screen linking connects your Lock Screen to a Focus, so you can activate a Focus by switching to the corresponding Lock Screen

- Focus filters hide distracting content in apps like Calendar, Mail, Messages, Safari and third party apps

- Streamlined setup makes it easier and faster to get started with Focus, with personalized Lock Screen and Home Screen suggestions that include apps and widgets that are relevant to the Focus you're setting up

Messages

- Edit a message for up to 15 minutes after sending it and recipients see a record of edits

- Undo send allows you to recall any message for up to 2 minutes after sending it

- Mark as unread makes it easy to come back to a conversation later

- SharePlay in Messages lets you enjoy activities like watching movies, listening to music, playing games, and more with friends while messaging

- Collaboration provides a simple way to invite others to collaborate on a file via Messages and get activity updates in the thread when someone makes an edit to a shared project

Mail

- Improved search delivers more accurate, complete results and provide suggestions as soon as you begin to type

- Undo send allows you to cancel delivery of a message within 10 seconds of hitting send

- Scheduled send for sending an email at a specific day and time

- Follow-up surfaces sent emails that have not been replied to, to the top of your inbox so you can quickly follow-up

- Remind me lets you schedule a date and time to be reminded about an email

Safari and Passkeys

- Shared Tab Groups let you share a set of tabs with others and see the Tab Group update instantly as you work together

- Tab Group start pages can be customized with different background images and favorites for each Tab Group

- Pinned tabs in Tab Groups enable you to pin frequently visited websites for each Tab Group

- Safari web page translation adds translation for web pages in Turkish, Thai, Vietnamese, Polish, Indonesian, and Dutch

- Passkeys offer support for an easier and safer sign-in method to replace passwords

- Passkey syncing through iCloud Keychain makes your passkeys available across all your Apple devices while keeping them end-to-end encrypted

Live Text

- Live Text video support allows you to interact with text in a paused video frame so you can copy, translate, lookup, share, and more (iPhone XS, iPhone XS Max, iPhone XR and later)

- Quick actions let you take action on data detected in photos and videos with a single tap, so you can track flights or shipments, translate foreign languages, convert currencies, and more (iPhone XS, iPhone XS Max, iPhone XR and later)

Visual Look Up

- Lift subject from background isolates the subject of an image so you can copy and paste it into apps like Mail and Messages (iPhone XS, iPhone XS Max, iPhone XR and later)

- Visual Look Up adds recognition of birds, insects, spiders, and statues in your photos (iPhone XS, iPhone XS Max, iPhone XR and later)

Siri

- Easy Shortcuts setup makes it possible to run shortcuts with Siri as soon as you download an app with no upfront setup (iPhone XS, iPhone XS Max, iPhone XR and later)

- A new setting allows you to send messages without Siri asking you to confirm before sending

- "Hey Siri, what can I do here?" helps you discover Siri capabilities in iOS and apps just by asking (iPhone XS, iPhone XS Max, iPhone XR and later)

- Call hang up option for ending Phone and FaceTime calls with Siri by saying "Hey Siri, hang up." (iPhone XS, iPhone XS Max, iPhone XR and later)

Dictation

- All-new Dictation experience supports using your voice and keyboard together to enter and edit text (iPhone XS, iPhone XS Max, iPhone XR and later)

- Automatic punctuation inserts commas, periods, and question marks as you dictate

- Emoji support lets you insert emoji using your voice (iPhone XS, iPhone XS Max, iPhone XR and later)

Maps

- Multi-stop routing supports adding up to fifteen stops along your driving route in Maps

- Transit cards in Maps let you see low balances and replenish your card when you add transit cards to Wallet, all without leaving Maps

- Transit fares show you how much your journey will cost in the San Francisco Bay Area, London, New York, and San Diego

Apple Pay and Wallet

- Apple Pay Order Tracking allows you to receive detailed receipt and order tracking information in Wallet for Apple Pay purchases with participating merchants

- ID cards in Wallet lets you share verified information with apps that require identity verification (iPhone 8 and later)

- Apple Account supports topping-up your account balance from your Apple Account card in Wallet

Home

- Redesigned Home app makes it easier to navigate, organize, view, and control your smart home accessories

- Home tab now integrates all your accessories, rooms, and scenes into a single tab for a whole-house view, allowing you to see your entire home at a glance

- Categories for lights, climate, security, speakers and TVs, and water let you quickly access all the relevant accessories organized by room, and displays more detailed status information

- New camera view displays up to four cameras front and center in the Home tab, scroll to see any additional camera views in your home

- Redesigned accessory tiles feature more visually recognizable icons that are color-matched to their category, and new behaviors for more precise accessory controls

Health

- Medications feature helps you track and manage your medications, vitamins and supplements by creating a list, custom schedules and reminders, and then viewing logging over time

- Add medications using your iPhone camera (iPhone XS, iPhone XR and later)

- Interaction alerts inform you if there is a critical interaction when you add a new medication

- Cycle deviation notifications alert you if your logged menstrual cycles show a pattern of infrequent periods, irregular periods, prolonged periods, or persistent spotting

- Invitations for Health Sharing allow loved ones to easily and securely share their health data with you

- Health Sharing reminders give you transparency and control over the health data you are sharing with loved ones

News

- My Sports enables you to easily follow your favorite teams and leagues and watch highlights right in the News app

- Favorites give you easy access to the channels and topics you read the most, in a consistent place near the top of your Today feed

- New homepages deliver visually updated and easier to navigate topic feeds for local news locales, sports teams and leagues, and more

Family Sharing

- Improved child account setup makes it easier to create an account for a child with the right parental controls, including age-appropriate media restrictions

- Device setup for a child lets you use Quick Start to easily set up a new iOS or iPadOS device for your child with your selected parental controls in place

- Screen Time requests in Messages make it even easier to approve or decline requests from your child

- Family Checklist gives you tips and suggestions like updating a child's parental control settings, turning on location sharing, or just reminding you to share your iCloud+ subscription with everyone

Safety Check

- Safety Check is a new section in Settings to help people in domestic or intimate partner violence situations quickly reset the access they've granted to others

- Emergency reset lets you quickly take action to reset access across all people and apps, including disabling location sharing via Find My, resetting privacy permissions for apps, and more

- Manage sharing and access helps you review and customize which apps and people can access your information

Accessibility

- Door detection in Magnifier locates a door, reads signs and symbols around it, and gives you instructions for how to open the door (iPhone 12 Pro and iPhone 13 Pro)

- Apple Watch mirroring provides full control of Apple Watch from iPhone and supports use of Switch Control, Voice Control, or any other assistive features on iPhone to get the most out of your Apple Watch

- Live Captions (beta) automatically converts audio into text for users who are Deaf or hard of hearing to follow along more easily with calls and media content (iPhone 11 and later)

- Buddy controller helps users with cognitive disabilities get support from a caregiver or friend while playing a game, by combining inputs from multiple game controllers into one

- VoiceOver is now available in over 20 new languages and locales, including Bangla (India), Bulgarian, Catalan, Ukrainian, and Vietnamese

- Voice Control spelling mode gives you the option to dictate names, addresses, or other custom spellings letter by letter

Other features and improvements:

- Fitness app lets you track and meet your fitness goals even if you don't yet have an Apple Watch, using iPhone motion sensors to give you an estimate of your calories to contribute to your daily Move goal

- AirPods Pro (2nd generation) support

- Personalized Spatial Audio uses the TrueDepth camera on iPhone to create a personal profile for Spatial Audio that delivers a more precise and immersive listening experience on AirPods (3rd generation), AirPods Pro (1st and 2nd generation), AirPods Max

- Handoff in FaceTime allows you to move FaceTime calls seamlessly from your iPhone to your iPad or Mac, and vice versa

- Memoji updates include more sticker poses, hairstyles, headwear, noses, and lip colors

- Quick Note adds support for taking a note in any app on your iPhone and adding links to create context and easily find content

- Translate camera lets you translate text around you using the camera in the Translate app

- Duplicate detection in Photos identifies duplicate photos so you can quickly clean up your library

- Foreground blur for portrait photos in Camera blurs objects in the foreground for a more realistic-looking depth-of-field effect (iPhone 13, iPhone 13 Pro, and iPhone 13 Pro Max)

- Pinned lists in Reminders helps you quickly navigate to your favorite lists

- Search on the Home Screen enables Spotlight to be accessed directly from the bottom of the Home Screen, making it easy to open apps, find contacts, or get information from the web

- Automatically send messages in CarPlay to skip the confirmation step when sending messages

- Rapid Security Response gets important security improvements to your devices even faster, as they can be applied automatically between standard software updates